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ADVANCING DIGITAL EDUCATION IN MALAYSIAN PUBLIC
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This work is licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/)**Abstract:**

This article investigates how the capacities and resources of Malaysian public universities influence the implementation of digital education policies. Utilizing a qualitative research design, the study collected data from interviews with 32 stakeholders, including university leaders, academic staff, students, and Ministry of Higher Education officials. The findings reveal that institutional capacity in terms of human resources, infrastructure, and internal governance significantly shapes digital education outcomes. Universities with robust ICT infrastructure, proactive leadership, and structured training programs are better equipped to align with national policies such as DePAN 2.0. Conversely, institutions facing staffing shortages, outdated systems, and limited autonomy struggle to adapt. The study emphasizes that effective policy implementation depends not only on funding but also on institutional readiness and collaborative governance models. Recommendations are offered to enhance institutional capacity for sustainable digital education.

Keywords:

University Capacity, Digital Infrastructure, Higher Education, Policy Implementation, Malaysia, DePAN 2.0, Institutional Readiness, University Capacities and Resources for Advancing Digital Education in Malaysian Public Universities

Introduction

The digitalisation of higher education in Malaysia is increasingly driven by global trends and national priorities, particularly those aligned with Malaysia's National e-Learning Policy (DePAN 2.0). As universities are expected to adapt to rapid technological advancements, the focus has shifted toward how institutional capacity influences the success or failure of these digital transformations. In this context, institutional capacity refers not only to financial or infrastructural readiness, but also to the availability of skilled human resources, internal governance structures, and the ability to foster innovation (Altbach & Salmi, 2011).

Previous studies have tended to focus primarily on macro-level strategies or national policy blueprints, often overlooking the micro-level realities of universities that are tasked with implementation. For instance, while DePAN 2.0 provides strategic direction, it does not account for disparities in institutional readiness across public universities (Ministry of Higher Education Malaysia, 2020). This study aims to fill that gap by investigating how internal capacities and resources either enable or constrain policy implementation at the institutional level.

Moreover, the COVID-19 pandemic has further exposed weaknesses in digital preparedness, with some institutions adapting quickly, while others struggled to transition even basic teaching functions online (UNESCO, 2021). These disparities underscore the urgent need for a deeper understanding of institutional conditions that influence digital policy outcomes. The study also builds on the notion that organisational change in universities is context-sensitive, and digital reforms cannot be uniformly applied across different institutions (Fullan & Scott, 2009).

The objective of this paper is to examine the specific institutional capacities such as digital infrastructure, leadership, and human resource development that influence the realisation of digital education policies. By focusing on Malaysian public universities, the study contributes to the growing body of literature on digital transformation in higher education by offering insights into what internal conditions are necessary to support sustainable reform. It further provides practical policy recommendations based on empirical evidence drawn from multiple stakeholders across the higher education ecosystem.

Understanding the unique institutional capacities of each university is vital for designing effective digital transformation strategies. Without addressing the internal readiness and contextual nuances, national policies risk being reduced to symbolic gestures rather than catalysts for meaningful change (DiMaggio & Powell, 1983). This study therefore advocates a differentiated and capacity-sensitive approach to digital policy implementation in Malaysian higher education.

Literature Review

Digital transformation in higher education has been widely studied, with research highlighting the interplay between institutional capacity, leadership, and policy implementation. Global studies show that successful digitalisation in universities depends on robust ICT infrastructure, skilled human capital, and adaptive governance structures (Bates, 2019; Selwyn, 2020). In the Southeast Asian context, disparities in resource allocation and policy uptake remain critical challenges, with urban universities often outpacing rural counterparts in technological readiness (Chan, 2021; UNESCO, 2021).

Malaysian higher education policy, particularly the *Pelan Tindakan e-Pembelajaran Negara* (DePAN 2.0), serves as a guiding framework for digital education. However, several studies indicate gaps between national strategies and institutional realities, especially in areas of staff training, funding mechanisms, and organisational culture (Ministry of Higher Education Malaysia, 2020; Ahmad & Zulkifli, 2020).

Institutional capacity is not solely a technical matter it involves cultural, social, and political dynamics that shape how universities respond to policy directives (Altbach & Salmi, 2011; Fullan & Scott, 2009). This aligns with organisational change literature, which emphasises that higher education reforms must be context-sensitive, acknowledging that institutional history, leadership style, and stakeholder engagement can significantly affect policy outcomes [(Birnbaum, 1988; Kezar, 2014)].

Given these complexities, it is essential to adopt a theoretical lens that explains why universities may adopt similar approaches despite differences in their contexts. Institutional theory, and specifically the concept of isomorphism, provides a relevant framework for analysing these patterns.

Theoretical Framework (Neo-Institutional Theory + Policy Implementation Approaches)

This study is guided by **neo-institutional theory** and draws upon policy implementation perspectives that encompass **top-down, bottom-up, and hybrid approaches**. Neo-institutional theory, particularly the concept of *isomorphism* as articulated by DiMaggio and Powell (1983), emphasises that organisations often change not solely for technical efficiency but to achieve **legitimacy** in the eyes of key stakeholders. These changes occur in response to regulatory pressures, societal expectations, and professional norms, which together shape institutional structures and practices.

Within this framework, three mechanisms of isomorphism are central:

1. **Coercive isomorphism** – Arising from formal mandates, resource dependencies, and cultural expectations (DiMaggio & Powell, 1983). In Malaysian public universities, coercive pressures are exerted by the Ministry of Higher Education (MOHE) through policies such as *Pelan Tindakan e-Pembelajaran Negara 2.0* (DePAN 2.0), tied funding allocations, and performance indicators (Ministry of Higher Education Malaysia, 2020).
2. **Mimetic isomorphism** – In uncertain contexts, institutions emulate peers perceived as more legitimate or successful, such as replicating the digital strategies of top-ranked universities locally and internationally (Maringe & Foskett, 2012; Hazelkorn, 2015).
3. **Normative isomorphism** – Rooted in professional norms and standards, these pressures emerge from shared academic training, peer networks, and accreditation requirements, leading to convergence in teaching, research, and digital practices (Scott, 2014; Kezar, 2014).

At the same time, this study recognises that **policy implementation** is not a linear process. Classic **top-down** approaches emphasise centrally defined objectives, compliance mechanisms, and hierarchical control, which align closely with coercive isomorphic pressures. In contrast, **bottom-up** approaches focus on the discretion, adaptation, and agency of implementers—reflecting how universities may reinterpret policies based on local contexts and

capacities. The **hybrid approach** acknowledges that successful implementation often combines these two logics, integrating national directives with participatory, context-sensitive decision-making at the institutional level.

By combining neo-institutional theory with policy implementation perspectives, this study situates university capacity within both **social legitimacy-seeking processes** and the **practical realities of translating policy into action**. This integrated framework allows for a nuanced analysis of why some institutions adapt and innovate effectively under national digital education policies, while others face constraints despite operating under the same regulatory environment.

Methodology

This study adopts a qualitative research methodology to investigate how institutional capacities influence the implementation of digital education policies in Malaysian public universities. Qualitative methods are particularly effective for exploring complex organisational and policy-related phenomena as they allow for rich, contextualised insights from multiple stakeholders (Creswell & Poth, 2018; Merriam & Tisdell, 2016).

A total of 32 semi-structured interviews were conducted with a diverse range of stakeholders, including university administrators, academic staff, students, and representatives from the Ministry of Higher Education. Semi-structured interviews were chosen to balance structure with flexibility, enabling participants to elaborate on their unique perspectives (Bryman, 2016; Kvale & Brinkmann, 2015).

The purposive sampling method was employed to ensure that participants represented various institutional types (research universities, comprehensive universities, and teaching-focused universities) and geographic locations (urban and rural campuses). Purposive sampling is widely used in qualitative research to intentionally select participants who can provide the most relevant and rich information on the research topic (Palinkas et al., 2015; Etikan et al., 2016). This diversity enabled a holistic understanding of institutional dynamics across different contexts.

The interviews were conducted between January and June 2023, with each session lasting between 45 and 60 minutes. All interviews were recorded, transcribed, and coded using NVivo software. NVivo facilitates systematic data management and analysis, allowing researchers to identify recurring patterns and themes efficiently (Bazeley & Jackson, 2013). Thematic analysis was used to identify recurring patterns and themes related to digital infrastructure, leadership, human resource development, and governance practices (Braun & Clarke, 2006).

To ensure research rigour and credibility, member checking was employed by sharing thematic summaries with participants for validation. Member checking helps to confirm the accuracy and trustworthiness of qualitative findings (Lincoln & Guba, 1985). Triangulation was also applied by cross-referencing interview data with institutional reports and policy documents, including DePAN 2.0 and strategic plans from selected universities. Triangulation strengthens the validity of findings by using multiple data sources and perspectives (Denzin, 2012).

Ethical approval was obtained from the Research Ethics Committee of the lead research institution. Informed consent was secured from all participants, and confidentiality was strictly maintained throughout the study, in accordance with established research ethics standards (Orb et al., 2001). This qualitative approach allowed for an in-depth exploration of institutional processes and stakeholder perceptions, offering rich insights into how university capacities affect the realisation of digital education reforms in Malaysia.

Table 3.2 – MOHE and Public Universities Informants for Semi-Structured Interviews

Category	Criteria	Informants
Policy-makers from MOHE	Officers, experts, and scholars involved in formulating and issuing digital education policies	R1 - Director in MOHE R2 - Director in MOHE R3 - One of the committee of experts in DePAN Policy 2.0
University Management - Academic Administrators - Professional Management in Public Universities	Academic administrators and professional staff managing and monitoring digital policy	R4 - Deputy Director (Innovation) -IIUM R5 - Deputy Dean– IIUM R6 - Senior Assistant Director – IIUM R7 - Assistant Director - IIUM R8 - Faculty Manager's Office – UM R9 – Deputy Dean – UiTM R10 – Head of Department – UPSI R11 – Deputy Director – UPSI R12 – Senior Officer – UPSI
Academicians	Lecturers with direct experience implementing digital education policies during and after COVID-19	R13 – Academician – IIUM R14 – Academician – IIUM R15 – Academician – IIUM R16 - Academician – IIUM R17 – Academician – UM R18 – Academician – UiTM R19 – Academician – UiTM R20 – Academician - UPSI
Students	Students with direct experience of digital education policies during and after COVID-19	R21 - Student Leader – IIUM R22 – Student Alumni IIUM R23 – Student Postgraduate IIUM R24 - Student alumni – UM R25 - Student alumni – UM R26 - Student alumni – UM

Category	Criteria	Informants
		R27 – Student Representative – UM
		R28 – Student Representative - UM
		R29 – Student Leader – UiTM
		R30 – Student Leader – UPSI
Politicians	Elected officials with perspectives on digital education policy in public universities	R31 – ADUN Rawang R32 – Members of Parliament Pahang

Findings and Discussion

The thematic analysis of interview data revealed substantial variations in how Malaysian public universities implemented digital education policies, reflecting differences in institutional readiness, leadership responsiveness, organisational culture, and the approach to policy implementation. While national frameworks such as *Pelan Tindakan e-Pembelajaran Negara 2.0* (DePAN 2.0) provided a strategic roadmap, the success of implementation on the ground was shaped by a complex interplay between **coercive, mimetic, and normative isomorphic pressures** (DiMaggio & Powell, 1983; Kezar, 2014) and **different policy implementation logics**—ranging from top-down mandates to bottom-up adaptations, and in some cases, hybrid models that combined both approaches.

Digital Infrastructure Readiness

Digital infrastructure emerged as a decisive factor influencing the pace, quality, and approach to implementation. Urban-based campuses generally benefited from stable internet connectivity, updated learning management systems (LMS), and well-equipped digital classrooms, enabling them to operationalise MOHE directives in a largely **top-down manner**, where policy goals could be met with minimal adaptation:

"Our LMS runs smoothly, and the bandwidth is sufficient even during peak hours. This gives us confidence to run hybrid classes without disruption." (R8 – UM)

In contrast, rural campuses often constrained by outdated technology and unstable internet connections were forced to adopt **bottom-up, adaptive measures** such as rescheduling online assessments and prioritising asynchronous content delivery to mitigate infrastructural challenges:

"We often have to postpone online assessments because the connection drops suddenly, especially during the rainy season." (R10 – UPSI)

These disparities mirror findings in previous studies on urban–rural gaps in digital readiness (Chan, 2021; UNESCO, 2021) and illustrate how infrastructural inequality can limit the uniform application of national policy. Under neo-institutional theory, such constraints weaken coercive isomorphic effects, as compliance with national directives becomes conditional on resource capacity rather than purely on regulatory pressure.

Human Resource Capacity

Human capital limitations were a recurring challenge across institutions, but the manner in which they were addressed reflected differing **policy implementation strategies**. In many cases, lecturers had minimal exposure to structured digital pedagogy training. Where top-down training programmes were available, they tended to be short-term workshops that provided initial exposure but failed to sustain competency growth:

"I learned to use the platform through YouTube tutorials and trial-and-error because formal training came too late." (R15 – IIUM)

Institutions that adopted **bottom-up or hybrid models** encouraging peer mentoring, collaborative communities of practice, and faculty-driven innovation were able to build more sustainable digital teaching capacities. This finding supports the argument that digital transformation requires not only technical resources but also **institutionalised professional development frameworks** (Bates, 2019; Selwyn, 2020). From a neo-institutional perspective, the lack of consistent professional standards reflects variability in normative isomorphic pressures, with each university setting its own baseline for competency.

Leadership and Organisational Autonomy

Leadership emerged as a pivotal determinant of policy outcomes, particularly in mediating the balance between national directives and local adaptation. Universities with visionary, proactive leadership—combined with decentralised decision-making—were able to quickly establish digital taskforces, coordinate training schedules, and provide rapid technical support. These cases demonstrated an effective **hybrid approach**, where coercive national policies were implemented with locally driven innovations:

"Within two weeks, we had a dedicated digital team, training schedules, and tech support ready for all faculties." (R4 – IIUM)

Conversely, institutions characterised by rigid hierarchies and centralised control exhibited slower responses, implementation delays, and lower staff morale, reflecting the challenges of a **pure top-down approach** in dynamic policy environments:

"We had to wait months for approvals, and by then, the momentum was gone." (R19 – UiTM)

These findings align with normative isomorphic processes, where leadership norms and peer benchmarking influence adaptability (Scott, 2014; Fullan & Scott, 2009). Strong leadership networks can accelerate reform diffusion, while rigid governance structures risk policy fatigue.

Stakeholder Engagement

The extent of faculty and student involvement significantly influenced the legitimacy, acceptance, and sustainability of digital education initiatives. Institutions that embedded **bottom-up participation**—through co-design of course delivery, pilot testing, and inclusive feedback mechanisms—reported greater ownership and adaptability:

"When students and lecturers co-design the course delivery, the policies make more sense and get more support." (R21 – IIUM)

In contrast, policies implemented via **pure top-down models**, where decisions were made without adequate consultation, often led to superficial compliance and minimal commitment:

"We were just told what to do without explanation; naturally, people just followed instructions without much commitment." (R26 – UM)

From a neo-institutional perspective, participatory governance enhances both normative and mimetic isomorphic processes—encouraging institutions to model collaborative practices observed in high-performing peers. Hybrid governance structures, where coercive mandates are complemented by stakeholder-led adaptation, were particularly effective in ensuring long-term uptake and reducing resistance (Kezar, 2014; Lincoln & Guba, 1985).

The findings illustrate that while **coercive pressures** from MOHE's directives provide a common policy baseline, actual implementation is mediated by infrastructure, human capital, leadership, and stakeholder engagement. **Mimetic behaviours** are evident where less-prepared universities adopt strategies from top-performing peers, while **normative isomorphism** operates through shared professional standards and accreditation processes. The variation in outcomes demonstrates that **hybrid policy implementation models**, which combine top-down mandates with bottom-up adaptation, offer the most promise for aligning national policy goals with local institutional realities.

Summary of Themes, Illustrative Quotes, Institutional Theory Linkages, and Policy Implementation Approaches

Theme	Illustrative Quote	Institutional Theory Mechanism	Policy Implementation Approach
Digital Infrastructure Readiness	"Our LMS runs smoothly, and the bandwidth is sufficient even during peak hours. This gives us confidence to run hybrid classes without disruption." (R8 – UM) "We often have to postpone online assessments because the connection drops suddenly, especially during the rainy season." (R10 – UPSI)	Coercive isomorphism – MOHE policies require digital readiness, but infrastructural inequalities lead to uneven compliance.	Urban campuses: Top-down – able to directly comply with MOHE mandates. Rural campuses: Bottom-up – adaptive measures taken to overcome infrastructural constraints.
Human Resource Capacity	"I learned to use the platform through YouTube tutorials and trial-and-error because formal training came too late." (R15 – IIUM)	Normative isomorphism – Lack of shared professional development standards creates variability in teaching practices.	Institutions with short workshops: Top-down – limited formal training from central management. Institutions with peer-learning: Hybrid – blending central guidelines with grassroots-driven initiatives.

Leadership and Organisational Autonomy	"Within two weeks, we had a dedicated digital team, training schedules, and tech support ready for all faculties." (R4 – IIUM) "We had to wait months for approvals, and by then, the momentum was gone." (R19 – UiTM)	Normative isomorphism – Leadership norms and peer benchmarking influence adaptability.	Decentralised, agile leadership: Hybrid – adapting national directives with local initiatives. Rigid hierarchies: Top-down – slow, centralised decision-making.
Stakeholder Engagement	"When students and lecturers co-design the course delivery, the policies make more sense and get more support." (R21 – IIUM) "We were just told what to do without explanation; naturally, people just followed instructions without much commitment." (R26 – UM)	Mimetic isomorphism – Institutions replicate participatory or top-down models observed in peer universities.	Co-design and inclusive feedback: Bottom-up/Hybrid – participatory governance integrated with national goals. Command-style directives: Top-down – limited consultation, low buy-in.

Policy and Practice Recommendations

The findings of this study highlight that achieving equitable and sustainable digital transformation across Malaysian public universities requires policy interventions that are both capacity-building and context-sensitive. While national frameworks such as Pelan Tindakan e-Pembelajaran Negara 2.0 (DePAN 2.0) establish a clear overarching direction, their actual effectiveness depends on the ability of individual institutions to operationalise these directives within their unique infrastructural, human, and organisational contexts. Reliable high-speed internet connectivity, modern learning management systems (LMS), and well-equipped digital classrooms are not simply desirable but essential prerequisites for meaningful policy implementation.

However, persistent disparities particularly between urban and rural campuses undermine the uniform application of these national mandates. Some geographically remote campuses continue to rely on outdated technology and contend with unstable networks, which directly impacts the quality and accessibility of digital learning. To address this challenge, the Ministry of Higher Education (MOHE) and institutional leaders should establish a Digital Equity Fund that is tied to periodic infrastructure audits and targeted resource allocation based on actual need rather than uniform funding formulas. Such an initiative would align the coercive pressures of national directives with tangible support mechanisms, thereby fostering a more balanced and equitable form of digital readiness across the sector.

In parallel, the institutionalisation of comprehensive and continuous professional development programmes is imperative for both academic and administrative staff. While short-term workshops may serve as initial entry points, they are insufficient for cultivating the depth of skills required for advanced digital pedagogy and technology integration in a rapidly evolving educational landscape. The evidence from this study reveals that many lecturers resorted to self-directed learning or informal peer support, resulting in variability in instructional quality. A more sustainable approach would involve embedding long-term professional development into institutional policy through structured frameworks that include mentorship schemes, micro-credentialing opportunities, and active peer-learning communities.

These initiatives should be formally linked to accreditation and quality assurance processes, enabling the normative isomorphic diffusion of shared professional standards across universities. From a policy implementation perspective, this represents a hybrid approach: central policy mandates establishing the baseline requirements for training, while institutions retain the flexibility to design and adapt programmes to local needs. Such alignment between top-down expectations and bottom-up adaptation not only enhances instructional quality but also ensures staff engagement in the reform process.

Leadership and governance structures also emerge as critical levers for effective policy translation. The study indicates that institutions with visionary, adaptive, and decentralised leadership were more capable of mobilising resources quickly, forming dedicated digital taskforces, and maintaining strong morale among staff. These leadership traits facilitated the rapid contextualisation of national policies, ensuring that reforms were not merely formal compliance exercises but integrated into core institutional strategies.

Conversely, universities with rigid hierarchies and centralised decision-making processes often experienced delays, low engagement, and policy fatigue. To address this gap, MOHE and university governing bodies should prioritise leadership development programmes, including fellowships, peer-network exchanges, and benchmarking exercises, which can encourage mimetic learning by enabling less-prepared institutions to emulate the strategies of high-performing peers. In policy implementation terms, this represents a hybrid model—retaining the strategic direction of top-down frameworks while empowering local leaders to exercise discretion in execution, thereby enhancing responsiveness and resilience in the face of technological change.

Lastly, embedding participatory governance mechanisms into institutional structures is essential for ensuring legitimacy, stakeholder buy-in, and sustainability of digital reforms. Involving faculty, students, and professional staff in planning, piloting, and refining digital initiatives encourages ownership, relevance, and commitment to long-term success. This study shows that top-down approaches often generate only superficial compliance, whereas collaborative processes result in stronger engagement and more enduring outcomes.

Establishing digital steering committees with multi-stakeholder representation can institutionalise this collaborative ethos, providing a permanent forum for dialogue, feedback, and iterative policy improvement. Furthermore, national digital transformation strategies should adopt differentiated and phased implementation models that recognise the heterogeneity of Malaysian public universities in terms of size, mission, and resource capacity. Such an approach allows coercive policy mandates to be balanced by adaptive local implementation—

thus preventing the deepening of existing inequalities and enabling a more inclusive, contextually relevant digital transformation agenda.

Conclusion

This study has offered a comprehensive exploration of how institutional capacities shape the implementation of digital education policies in Malaysian public universities, drawing on qualitative insights from a diverse set of stakeholders, including policymakers, university administrators, academics, students, and political representatives. The findings demonstrate that the successful realisation of national digital education agendas is not solely determined by compliance with centrally defined directives but is fundamentally contingent on the interplay between institutional readiness, leadership adaptability, human capital competence, and stakeholder engagement. While frameworks such as *Pelan Tindakan e-Pembelajaran Negara 2.0* (DePAN 2.0) provide an overarching blueprint, their practical translation into meaningful outcomes is mediated by local contexts, organisational culture, and institutional agency. This reinforces the central premise of **neo-institutional theory** that organisational behaviour is shaped not only by technical requirements but also by coercive pressures, mimetic tendencies, and normative influences operating within interconnected professional and policy networks.

The pronounced disparities in digital readiness across institutions reveal the inherent limitations of uniform, top-down policy models in a higher education system characterised by structural, geographic, and resource heterogeneity. Universities with visionary leadership, adaptive governance, and participatory decision-making processes were able to rapidly mobilise resources, form dedicated digital taskforces, and integrate innovative pedagogical approaches, embodying a *hybrid policy implementation approach* where national mandates were adapted to local realities. In contrast, institutions constrained by rigid hierarchies, limited autonomy, and inadequate stakeholder involvement struggled with delays, fragmented implementation, and minimal acceptance among academic communities. These divergent trajectories affirm that while **coercive isomorphic pressures** from national policies may ensure a baseline of compliance, the transformative potential of digital reforms depends heavily on the capacity of institutions to engage in **bottom-up adaptation** and collaborative problem-solving, supported by shared professional norms and peer learning.

The implications of these findings extend beyond a narrow evaluation of policy outcomes to underscore the conditions necessary for sustainable digital transformation in higher education. Achieving lasting change requires strategies that are simultaneously **context-sensitive, capacity-enhancing, and participatory**. National frameworks must be flexible enough to accommodate differentiated pathways to implementation, enabling institutions to leverage their unique strengths while addressing systemic weaknesses. This alignment between macro-level directives and micro-level agency is critical to preventing reforms from becoming symbolic exercises with limited practical impact. From a theoretical standpoint, the study demonstrates how **neo-institutional theory** and **policy implementation frameworks**—particularly hybrid models that balance top-down direction with bottom-up innovation—can jointly explain the complexities of policy enactment in diverse higher education environments.

Future research should adopt longitudinal and comparative approaches to examine how institutional capacities evolve over time, especially in response to shifting technological, political, and economic landscapes. Investigating whether early gains in digital readiness are sustained, enhanced, or eroded will provide valuable insights for policymakers and institutional

leaders seeking to embed resilience in digital strategies. As digital education becomes an enduring pillar of Malaysia's higher education agenda, the challenge will be to ensure that policy and practice remain dynamically aligned. Without such alignment, digital reforms risk reinforcing existing inequalities and stagnating as compliance-driven formalities; with it, they hold the potential to catalyse deep, systemic transformation that embeds innovation and equity at the heart of the higher education sector.

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