

FROM GRADUATE DATA TO INSTITUTIONAL ACTION: MALAYSIAN EVIDENCE ON INTEGRATED GOVERNANCE FOR GRADUATE OUTCOMES

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Abstract: Graduate employability has become a strategic priority in higher education as universities face increasing pressure to demonstrate not only whether graduates secure employment, but also the quality, relevance and sustainability of their employment outcomes. This study develops an Integrated Graduate Employability Governance Framework using Universiti Teknologi MARA (UiTM), Malaysia, as an explanatory institutional case. A qualitative explanatory case study supported by descriptive quantitative analysis was employed, drawing on national graduate tracer data from 2019 to 2025, institutional dashboard analytics, governance documents and stakeholder evidence. The findings identify three interrelated dimensions of employability governance: Digital Employability Intelligence, Evidence-Based Employability Governance and integrated institutional capability. Graduate tracer data were transformed into institutional intelligence through the UiTM Graduate Employability Impact Dashboard and subsequently embedded within leadership reporting, faculty accountability, academic quality processes and targeted institutional interventions. Longitudinal analysis showed that Graduate Employability increased from 79.2% in 2019 to 94.5% in 2025, employment aligned with field of study increased from 55.4% to 67.2%, the proportion of first-degree graduates earning above RM4,000 rose from 3.0% to 7.7%, and multinational corporation placements increased from 1,664 to 5,147. The proposed framework integrates six institutional capabilities: governance and leadership, digital employability intelligence, academic and curriculum responsiveness, student and graduate development, industry and entrepreneurship partnership, and talent ecosystem and sustainability. The study

reconceptualises graduate employability as an institutional governance capability and provides a practical model for translating graduate outcome data into evidence-informed decisions, coordinated action and continuous improvement.

Keywords: *Graduate Employability, Higher Education Governance, Data-Driven Leadership, Graduate Outcomes*

Introduction

Higher education institutions are increasingly required to respond to rapid labour market transformation driven by artificial intelligence, automation, digitalisation and changing workforce expectations. The acceleration of Industry 4.0 and digital economies has reshaped employment structures, creating new forms of work while increasing demand for adaptive, digitally competent and industry-relevant graduates (World Economic Forum, 2023). As a result, universities are no longer evaluated solely by their ability to produce academically qualified graduates, but also by their capacity to develop future-ready talent capable of sustaining meaningful employment in dynamic labour market environments (OECD, 2021).

Graduate employability has therefore become a strategic priority in higher education. Contemporary employability discourse has moved beyond simple employment rates towards broader graduate outcomes, including quality employment, salary competitiveness, entrepreneurship, career adaptability, skills relevance and long-term workforce sustainability (Clarke, 2018; Tomlinson, 2017). This shift reflects growing concerns regarding graduate unemployment, underemployment, skills mismatch and low starting salaries despite continued expansion of higher education participation (ILO, 2022). In this context, universities are expected to strengthen programme relevance, industry alignment and graduate readiness through more responsive institutional systems.

In Malaysia, graduate employability has become a national strategic agenda rather than merely an institutional performance indicator. It is reflected in policy directions such as the Thirteenth Malaysia Plan (RMK-13), which introduced the indicator “Kadar Bekerja Graduan Setara Kelayakan Pendidikan” with a national target of 70.1%. It is also aligned with the Higher Education Transformation Plan 2026-2035, which aspires to produce future-oriented talent who are progressive, dynamic, nation-building and future-ready. In addition, national agendas such as the National Entrepreneurship Policy 2030 and the New Industrial Master Plan 2030 emphasise graduate entrepreneurship, high-skilled employment and high-value workforce development. These policy directions indicate that graduate employability is increasingly connected to national productivity, economic competitiveness and sustainable talent development.

The complexity of employability governance is further intensified by the scale of Malaysia’s higher education ecosystem. More than 2,800 academic programmes are offered across public and private higher education institutions, while more than 300,000 graduates enter the labour market annually (MOHE, 2024). Although this expansion has improved access to higher education, it has also increased competition among graduates and created challenges in ensuring programme relevance, labour market alignment and employment quality. These challenges are compounded by labour market realities, where vacancies are unevenly distributed across sectors and qualification levels, and where technological disruption continues to reshape skills demand (DOSM, 2024).

In response to these developments, conventional employability management approaches are no longer sufficient. Approaches that rely mainly on annual reporting, isolated career programmes or reactive interventions provide limited institutional agility in addressing complex and shifting employability challenges. Instead, universities require integrated governance mechanisms capable of converting graduate outcome data into evidence-based decisions, targeted interventions and continuous institutional learning. This has increased scholarly interest in data-driven leadership, institutional analytics and digital governance in higher education (Daniel, 2015; Williamson et al., 2020).

Data-driven leadership refers to the strategic use of institutional data, analytics and evidence to support organisational decision-making, intervention design and performance improvement (Marsh et al., 2006). In higher education, digital dashboards and institutional intelligence systems can support leaders in identifying performance gaps, monitoring institutional outcomes and strengthening accountability (Arnold & Pistilli, 2012). However, while existing studies have examined graduate employability, digital transformation and institutional analytics separately, limited empirical evidence explains how digital governance systems and data-driven leadership jointly contribute to sustained graduate employability improvement in large higher education institutions. Consequently, the governance mechanisms through which institutional intelligence is translated into sustained graduate employability improvement remain insufficiently understood.

Against this backdrop, Universiti Teknologi MARA (UiTM), one of Malaysia's largest multi-campus public universities, provides a relevant institutional case. UiTM recorded continuous improvement in Graduate employability performance from 89.5% in 2023 to 92.1% in 2024 and 94.5% in 2025. This improvement offers an opportunity to examine how institutional analytics, leadership structures and governance interventions contributed to employability enhancement at scale.

Therefore, this study develops an Integrated Graduate Employability Governance Framework by examining how institutional intelligence, data-driven leadership and digital governance were operationalised to enhance graduate employability within UiTM. Graduate outcomes are conceptualised across four complementary dimensions: graduate employability, employment aligned with field of study, premium starting salary and employment in multinational corporations. Drawing upon these dimensions, the study proposes a governance framework grounded in institutional implementation evidence and measurable graduate outcomes.

Literature Review

Graduate Employability in Higher Education

Graduate employability has become a central concern in higher education due to increasing labour market uncertainty, technological disruption and rising expectations from employers and policymakers. Earlier studies often defined employability in relation to graduates' ability to secure employment after graduation (Harvey, 2001; Yorke, 2006). More recent scholarship, however, conceptualises employability as a multidimensional construct involving career adaptability, transferable skills, work readiness, digital capability, entrepreneurship and long-term career sustainability (Clarke, 2018; Tomlinson, 2017).

Tomlinson's (2017) Graduate Capital Model is particularly influential in explaining graduate employability as a combination of human, social, cultural, identity and psychological capital.

This perspective suggests that employability is shaped not only by academic qualifications, but also by graduates' networks, self-efficacy, identity development and ability to navigate labour market expectations. Clarke (2018) similarly argues that employability should be understood as an interaction between individual attributes, institutional support and labour market context. These perspectives are useful for the present study because they position employability as a shared responsibility involving graduates, universities and external stakeholders.

Recent studies also highlight that employability is increasingly shaped by technological transformation and changing skill demands. Graduates are expected to demonstrate adaptability, digital literacy, communication skills, analytical thinking and entrepreneurial capability in addition to discipline-specific knowledge (Bridgstock, 2009). Consequently, higher education institutions must strengthen not only curriculum content, but also broader employability ecosystems involving industry engagement, career development, work-integrated learning and lifelong learning support.

However, employability challenges persist despite extensive institutional efforts. Graduate unemployment, underemployment, salary concerns and skills mismatch remain widely reported across different higher education systems (ILO, 2022). These issues suggest that employability cannot be addressed through isolated career activities alone. Instead, it requires coordinated institutional governance capable of identifying gaps, aligning programmes with labour market demand and implementing evidence-based interventions.

While these perspectives explain the determinants of graduate employability, they provide limited guidance on how universities should organise leadership and governance mechanisms to improve employability systematically. This has shifted attention towards data-driven leadership and institutional decision-making.

Data-Driven Leadership in Higher Education

The increasing complexity of higher education management has strengthened interest in data-driven leadership. Data-driven leadership refers to the systematic use of evidence, analytics and institutional data to support decision-making, strategic planning and organisational improvement (Marsh et al., 2006). In contemporary higher education, leaders are increasingly expected to make decisions based on reliable institutional intelligence rather than fragmented reporting or anecdotal assumptions.

Institutional analytics and dashboard systems have become important tools for supporting this transformation. Daniel (2015) argues that big data and analytics offer significant opportunities for higher education institutions to improve planning, monitoring and performance management. Similarly, Ifenthaler and Yau (2020) note that analytics can support institutional decision-making when data are meaningfully interpreted and connected to action. These studies suggest that the value of analytics lies not merely in data availability, but in the ability of leaders to translate evidence into organisational response.

Within graduate employability governance, data-driven leadership is particularly important because graduate outcomes are influenced by multiple factors, including curriculum relevance, student preparedness, industry demand, salary competitiveness, entrepreneurship and labour market conditions. Without integrated data systems, institutions may rely on aggregate employment rates that obscure programme-level issues or quality employment concerns.

Therefore, data-driven leadership can enable institutions to identify hidden gaps, prioritise interventions and strengthen accountability across faculties and programmes.

Nevertheless, prior studies also warn that institutional data systems do not automatically produce better decisions. Williamson et al. (2020) argue that the datafication of higher education must be understood critically because data only become meaningful when embedded within governance, interpretation and organisational learning processes. This indicates a gap in the literature: more empirical studies are needed to examine how universities transform analytics into actual leadership behaviour and governance action.

However, evidence-based leadership depends on institutional systems capable of generating timely, reliable and actionable intelligence, highlighting the importance of digital governance.

Digital Governance and Institutional Analytics

Digital governance refers to the integration of digital systems, data infrastructures and analytics into organisational decision-making and governance processes (Meijer & Bolívar, 2016). In higher education, digital governance extends beyond administrative digitalisation. It includes institutional intelligence systems, dashboards, performance monitoring, integrated reporting and evidence-based decision support.

Institutional intelligence refers to the systematic transformation of organisational data into actionable evidence that supports strategic planning, governance and continuous improvement. Dashboard systems are particularly relevant to institutional governance because they translate complex datasets into accessible visual information for leaders and decision-makers. Arnold and Pistilli (2012) demonstrated how analytics-based systems can support timely institutional responses, while Long and Siemens (2011) argued that analytics allows higher education institutions to move from retrospective reporting towards more predictive and evidence-based decision-making. Within graduate employability, dashboards may help universities monitor employment outcomes, salary patterns, programme performance, employer demand and graduate entrepreneurship indicators.

However, digital governance remains underexplored in relation to graduate employability improvement. Existing literature often examines digital transformation, institutional analytics and employability as separate areas of inquiry. Less is known about how dashboard analytics can be embedded into leadership structures, faculty accountability, curriculum review and stakeholder engagement to produce measurable graduate outcome improvements. This study addresses that gap by examining how UiTM transformed graduate tracer data into institutional intelligence and governance action.

Nevertheless, digital governance alone is insufficient unless it is embedded within broader institutional and stakeholder ecosystems that sustain employability improvement.

Institutional Employability Ecosystems and Sustainable Governance

Recent higher education research increasingly recognises that graduate employability cannot be achieved through curriculum reform or career services alone, but instead requires coordinated institutional ecosystems involving multiple internal and external stakeholders. The employability ecosystem perspective views graduate employability as the outcome of dynamic interactions among universities, employers, government agencies, students, alumni and wider society rather than the responsibility of any single organisational unit (Bridgstock & Jackson, 2019). This perspective reflects the growing complexity of labour market transitions, where graduate success depends not only on disciplinary knowledge but also on institutional

responsiveness, stakeholder collaboration and continuous adaptation to changing workforce demands.

From an ecosystem perspective, universities function as coordinators of interconnected employability activities rather than isolated providers of education. Academic faculties, career development units, industry partners, entrepreneurship centres, alumni networks and government agencies each contribute complementary roles in preparing graduates for employment. Consequently, improving graduate employability requires institutional mechanisms capable of integrating these diverse actors into coherent governance processes. Such coordination enables universities to align curriculum development, industry engagement, graduate development initiatives and labour market intelligence within a shared strategic direction, thereby strengthening institutional responsiveness and graduate outcomes (Bridgstock & Jackson, 2019).

The importance of multi-stakeholder collaboration is further emphasised by the Quintuple Helix Innovation Model, which extends the traditional Triple Helix framework by incorporating the broader roles of community and the natural environment alongside academia, industry and government (Carayannis & Campbell, 2010; Carayannis et al., 2018). Within higher education, the Quintuple Helix model provides a useful governance perspective by recognising that sustainable talent development depends upon collaborative interactions among universities, industries, government agencies, civil society and environmental sustainability agendas. Rather than viewing graduate employability solely as an institutional performance indicator, the model positions employability as a shared societal responsibility requiring coordinated contributions from multiple stakeholders.

This ecosystem perspective aligns closely with the concept of sustainable governance, which emphasises long-term institutional adaptability, evidence-informed decision-making and continuous organisational learning (Avery & Bergsteiner, 2011). Sustainable governance extends beyond achieving short-term graduate employment targets by developing institutional capabilities that enable universities to respond proactively to evolving labour market conditions, technological disruption and changing policy priorities (Hargreaves & Fink, 2006). Such governance systems are characterised by strategic leadership, stakeholder engagement, integrated information systems and continuous performance monitoring that collectively support institutional resilience and long-term graduate success.

Towards an Integrated Graduate Employability Governance Framework

The preceding review demonstrates that graduate employability has evolved from a graduate-centred concept into a strategic higher education agenda closely associated with institutional accountability, workforce competitiveness and national development. While previous studies have substantially advanced understanding of graduate employability through perspectives such as graduate capital, employability skills, work-integrated learning, industry engagement and employability ecosystems (Clarke, 2018; (Bridgstock & Jackson, 2019; Tomlinson, 2017), parallel developments in higher education management have highlighted the growing importance of data-driven leadership, institutional analytics and digital governance in supporting evidence-based organisational decision-making (Daniel, 2015; Ifenthaler & Yau, 2020; Williamson et al., 2020). However, these bodies of knowledge remain insufficiently integrated, indicating the need for a more comprehensive governance perspective.

First, graduate employability research continues to focus predominantly on graduate attributes, curriculum design and industry engagement, while providing limited attention to employability as an institutional governance capability. Existing studies largely explain what influences graduate employability but provide less insight into how universities should organise governance structures, leadership mechanisms and institutional processes to improve graduate outcomes systematically.

Second, although higher education research increasingly recognises the value of institutional analytics and digital governance, relatively few empirical studies explain how graduate outcome data are transformed into institutional intelligence that informs leadership behaviour, strategic decision-making and evidence-based governance. Consequently, the relationship between institutional analytics and organisational action remains insufficiently understood.

Third, existing literature tends to examine graduate employability, digital governance, institutional analytics and stakeholder collaboration as separate domains of inquiry. There remains limited empirical evidence integrating these perspectives into a coherent governance model capable of supporting continuous institutional improvement across curriculum development, industry collaboration, student development, entrepreneurship, alumni engagement and policy alignment.

Addressing these gaps, this study develops an Integrated Graduate Employability Governance Framework grounded in empirical evidence from Universiti Teknologi MARA (UiTM). The framework integrates Digital Employability Intelligence, Evidence-Based Employability Governance and coordinated multi-stakeholder collaboration into a unified institutional governance model. In doing so, the study reconceptualises graduate employability as an institutional governance capability rather than solely as a graduate, curriculum or student development outcome. The next section describes the research design and institutional context through which the proposed framework was developed and operationalised.

Methodology

Research Design

This study adopted a qualitative explanatory case study supported by descriptive quantitative analysis to examine how graduate outcome data were transformed into institutional intelligence and embedded within governance mechanisms to support graduate employability improvement.

An explanatory case study was considered appropriate because the study sought to understand organisational processes, leadership practices, and governance structures within their real-life institutional context (Yin, 2018). Rather than testing statistical causality, the study focused on explaining how institutional intelligence, evidence-based leadership, and coordinated governance practices were operationalised within a complex higher education environment.

Universiti Teknologi MARA (UiTM) was purposively selected as an information-rich institutional case because of its scale, multi-campus structure, and sustained improvement in graduate employability outcomes. UiTM produces approximately 50,000-60,000 graduates annually and operates across multiple faculties and branch campuses, providing a suitable setting for examining employability governance at institutional scale.

Methodological triangulation was employed by integrating quantitative, documentary and stakeholder evidence, as detailed in Sections 3.3 and 3.5.

Institutional Context

UiTM is one of Malaysia's largest public universities and operates a nationwide multi-campus system comprising the main campus, branch campuses, and academic faculties. Its institutional scale and organisational complexity create a governance environment in which graduate employability must be coordinated across multiple disciplines, campuses, and stakeholder groups.

Graduate employability is centrally coordinated through the Office of Industry, Community and Alumni Network (ICAN), which facilitates institutional collaboration across academic faculties, central administrative units, industry partners, government agencies, and alumni networks. Graduate outcomes are also monitored through formal university governance structures, including leadership reporting, Senate review, and faculty-level accountability mechanisms.

The study also draws on the Sistem Kajian Pengesanan Graduan (SKPG), the national Graduate Tracer Study administered by the Ministry of Higher Education Malaysia. SKPG provides standardised information on graduate employment status, salary, employment characteristics, entrepreneurship, further study, and field-of-study alignment, thereby providing a consistent longitudinal evidence base for institutional employability monitoring.

Data Sources

The study used four categories of evidence. First, national graduate outcome data were obtained from SKPG records covering 2019-2025. Second, institutional analytics were drawn from the UiTM Graduate Employability (GE) Impact Dashboard, which integrates SKPG data into analyses across faculties, campuses and academic programmes. Third, governance evidence was obtained from Senate reports, PEMANDU GE Committee documents, faculty employability report cards and institutional planning documents. Fourth, qualitative evidence was derived from faculty engagement sessions, graduate feedback during convocation, labour market intelligence and industry consultations. These sources enabled the study to examine graduate employability governance from both quantitative and qualitative perspectives.

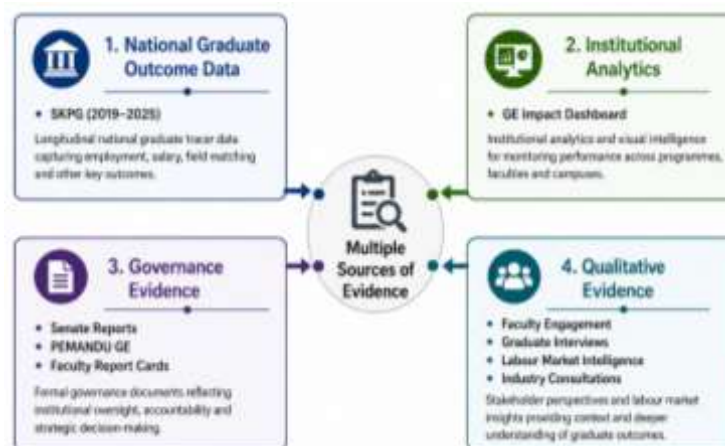


Figure 1: Sources of Evidence Used in the Study

Operationalisation and Governance Framework

The framework was examined through six institutional capabilities: Governance and Leadership, Digital Employability Intelligence, Academic and Curriculum Responsiveness, Student and Graduate Development, Industry and Entrepreneurship Partnership, and Talent Ecosystem and Sustainability. These capabilities served as the analytical domains used to examine how evidence moved through institutional structures into decisions and interventions

Data Analysis

Quantitative analysis involved descriptive statistics and longitudinal trend analysis of SKPG and dashboard data from 2019 to 2025. The main indicators examined included Graduate Employability, employment aligned with field of study, graduate salary outcomes, employment in multinational corporations, entrepreneurship, and programme-level performance.

Qualitative analysis involved the interpretation of governance documents and stakeholder evidence to identify leadership practices, accountability mechanisms, institutional responses, and contextual factors associated with graduate employability governance. Faculty engagement findings, graduate feedback, labour market intelligence, and industry consultation were used to support interpretation of quantitative trends.

Institutional triangulation was applied by comparing findings across SKPG data, dashboard analytics, governance documents, and stakeholder evidence. The analysis focused on identifying areas of convergence between graduate outcome trends, governance mechanisms, and institutional responses. The study did not seek to establish statistical causality; instead, it aimed to explain how evidence-based governance processes were associated with graduate employability improvement over time.

Results and Discussion

Digital Employability Intelligence

The first finding demonstrates how national graduate tracer data were transformed into institutional intelligence. Rather than functioning as an annual reporting exercise, SKPG data became a strategic resource for monitoring graduate employability and supporting institutional planning. The UiTM GE Impact Dashboard served as the analytical platform that converted raw graduate outcome data into meaningful institutional evidence.



Figure 2: Transformation of National Graduate Tracer Data into Institutional Intelligence

The transformation process began with graduate responses collected through the Ministry of Higher Education (MOHE) Graduate Tracer Study (SKPG). Official datasets were retrieved from the MOHE Anjung SKPG system and integrated into the UiTM GE Impact Dashboard. The dashboard subsequently organised seven years of graduate outcome data (2019-2025) into interactive institutional analytics.

The dashboard generated intelligence across multiple organisational levels. Instead of presenting only an overall Graduate employability rate, it enabled analyses by faculty, programme, salary, employer, employment sector and graduate characteristics. This multidimensional approach allowed institutional leaders to identify patterns that were not visible through conventional reporting.





Figure 2: Multidimensional Institutional Intelligence Generated by the UiTM GE Impact Dashboard

The dashboard also functioned as an institutional early warning system. Faculty-level analyses highlighted performance variation between academic units, while programme-level analytics identified specific programmes requiring further investigation. Salary and employer analytics provided additional evidence on employment quality and labour market competitiveness. These insights supported more focused institutional planning rather than broad university-wide interventions.

Longitudinal analysis showed improvement across the four graduate outcome indicators examined in this study. Graduate Employability increased from 79.2% in 2019 to 94.5% in 2025. Employment aligned with field of study increased from 55.4% to 67.2%, after declining to 49.0% in 2021. Among first-degree graduates, the proportion receiving a monthly starting salary above RM4,000 increased from 3.0% to 7.7%. Placements in multinational corporations (MNCs) increased from 1,664 to 5,147 graduates over the same period.

Table 1. Institutional Graduate Employability Performance Indicators, 2019-2025

Performance Dimension	Indicator	2019	2020	2021	2022	2023	2024	2025
Graduate Employability (GE) Score		79.2%	78.4%	82.7%	88.2%	88.8%	92.1%	94.5%
Employment Alignment with Field of Study (BDB)		55.4%	53.2%	49%	53.3%	58.3%	61%	67.2%
Monthly Starting Salary (> RM4,000, First degree)		3.0%	3.1%	2.9%	4.4%	5.7%	7.1%	7.7%
Placements in Multinational Corporations (MNCs)		1,664	2,044	2,742	4,635	4,830	5,043	5,147

Source: UiTM Graduate Employability Impact Dashboard System Database.

The strongest improvements were observed in the later years of the series, including 2024-2025, when dashboard monitoring, leadership reporting, faculty engagement, and coordinated employability interventions were implemented more systematically. As this study is explanatory and descriptive, these temporal patterns are interpreted as an association with the period of more systematic governance implementation rather than as evidence of statistical causality.

Evidence-Based Employability Governance

The second finding shows that institutional intelligence was subsequently embedded within formal university governance processes. Dashboard analytics were translated into Faculty Graduate Employability Report Cards, providing deans and campus rectors with consistent

summaries of GE performance, employment alignment with field of study, salary outcomes, and employer profiles. The report cards therefore served as a faculty-level accountability mechanism and provided a common evidence base for reviewing performance and identifying areas requiring attention.

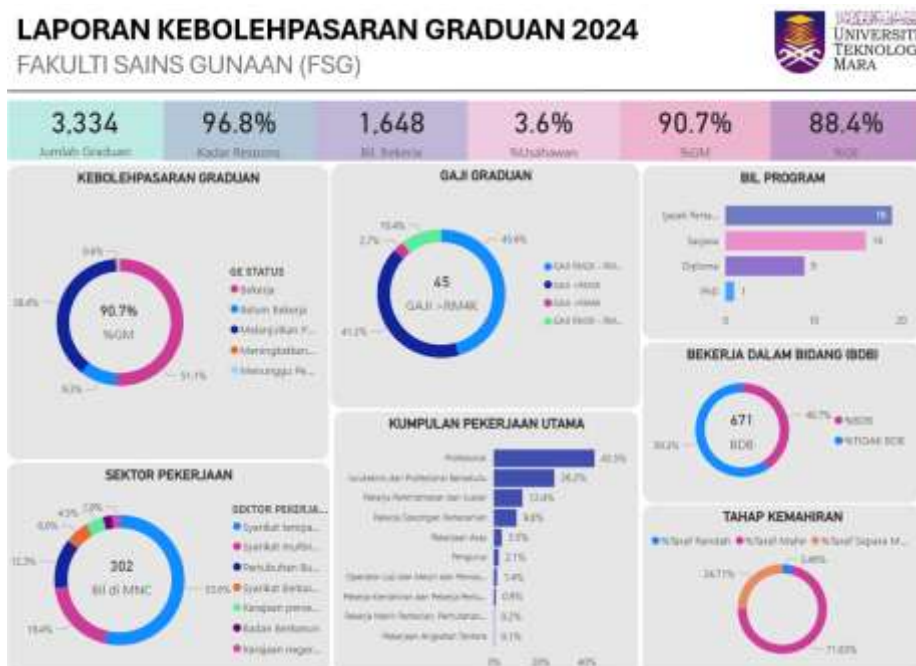


Figure 3: Example of a Faculty Graduate Employability Report Card used for institutional accountability.

Institutional intelligence was also reviewed through the Graduate Employability Steering Committee (Jawatankuasa PEMANDU Kebolehpasaran Graduan), chaired by the Vice-Chancellor. Dashboard findings were discussed through this governance structure and strategic matters were subsequently reported to the University Senate. This established a formal pathway through which graduate outcome evidence could move from monitoring into leadership review and institutional decision-making.

The use of employability evidence extended into academic governance and quality assurance. Graduate outcome indicators informed curriculum review, Market Need Analysis, the Integrated Programme Self-Assessment (IDSPA), and university quality objectives through collaboration with the academic affairs function. Structured engagement sessions with faculties, campuses, and strategic offices provided further opportunities to interpret programme-level findings. Graduate feedback and labour market consultations complemented the quantitative evidence by providing contextual information on employment barriers, programme relevance, and changing employer expectations.

Taken together, the evidence indicates that the institutional use of graduate analytics developed beyond performance reporting. Graduate outcome data were progressively incorporated into mechanisms for leadership review, faculty accountability, academic quality processes, and targeted institutional responses.

These findings support previous arguments that institutional analytics generate organisational value only when data are connected to interpretation, leadership and action (Ifenthaler & Yau,

2020; Williamson et al., 2020). The UiTM case extends this literature by demonstrating how graduate outcome analytics can be embedded within formal university governance through faculty accountability, leadership review and academic quality processes.

Integrated Graduate Employability Governance Framework

The third finding was the emergence of an integrated governance structure linking multiple institutional capabilities. Analysis of the governance evidence showed that graduate employability improvement was not associated with a single programme or organisational unit, but with the coordinated interaction of six capabilities: Governance and Leadership, Digital Employability Intelligence, Academic and Curriculum Responsiveness, Student and Graduate Development, Industry and Entrepreneurship Partnership, and Talent Ecosystem and Sustainability.



Figure 4: Integrated Graduate Employability Governance Framework.

Within the framework, Digital Employability Intelligence provides the evidence base, while Governance and Leadership provides the formal structures through which that evidence is reviewed and acted upon. Academic and Curriculum Responsiveness connects graduate outcome evidence to programme review and quality assurance, whereas Student and Graduate Development translates identified needs into career preparation and employability support. Industry and Entrepreneurship Partnership extends institutional responses to employers, professional development, and entrepreneurship, while Talent Ecosystem and Sustainability connects the university with alumni, labour market intelligence, government, community, and other external stakeholders.

The evidence also showed interaction across these capabilities. Graduate outcome data informed leadership review through the Steering Committee, Senate reporting, and faculty report cards; academic findings were linked to curriculum and programme monitoring; identified student needs informed career development and industry-facing interventions; and

external employer and labour market information was incorporated into institutional planning. The resulting governance process can be represented as a continuous cycle of evidence, decisions, actions, and outcomes.

Accordingly, the principal empirical result of the study is not the operation of the dashboard in isolation, but the way in which graduate outcome intelligence became connected to formal governance, academic responsiveness, student development, industry engagement, and the wider talent ecosystem. This integrated configuration constitutes the proposed Graduate Employability Governance Framework examined in this study.

Conclusion

Graduate employability has become an increasingly important indicator of higher education performance and national talent development. However, improving graduate outcomes requires more than curriculum enhancement, career development activities, or industry engagement conducted in isolation. It requires institutional mechanisms capable of converting graduate outcome data into intelligence, embedding that intelligence within governance processes, and translating evidence into coordinated action.

Using Universiti Teknologi MARA (UiTM) as an explanatory institutional case, this study identified three interrelated elements supporting graduate employability governance: Digital Employability Intelligence, Evidence-Based Employability Governance, and integrated institutional capability. These elements were operationalised through six governance capabilities encompassing leadership, analytics, academic responsiveness, student and graduate development, industry and entrepreneurship partnership, and talent ecosystem sustainability.

The resulting Integrated Graduate Employability Governance Framework explains how graduate outcome evidence can move through a continuous cycle of evidence, decisions, actions, and outcomes. The central contribution of the study lies not in the use of a dashboard alone, but in demonstrating how institutional intelligence can be embedded within leadership, academic governance, accountability, and stakeholder collaboration.

By positioning graduate employability as an institutional governance capability, this study offers a broader perspective on how universities can organise and sustain employability improvement. The framework provides a practical foundation for higher education institutions seeking to move beyond fragmented employability initiatives towards a more integrated, evidence-based, and continuously responsive approach to improving graduate outcomes.

Theoretical and Practical Contributions

This study contributes to both the graduate employability and higher education governance literature by reframing graduate employability as an institutional governance capability rather than solely as a graduate, curriculum, or student development outcome. While much of the existing literature emphasises graduate attributes, employability skills, curriculum design, and industry engagement, this study demonstrates how graduate outcome data can be transformed into institutional intelligence and embedded within formal governance processes to support evidence-informed decision-making.

The study further contributes by integrating Digital Employability Intelligence, Evidence-Based Employability Governance, and coordinated institutional capabilities within a single governance perspective. The proposed Integrated Graduate Employability Governance

Framework illustrates how institutional analytics, leadership structures, academic responsiveness, student development, industry engagement, and wider talent ecosystem relationships can operate as interconnected components of an institutional improvement system. In this sense, the study extends existing employability research by shifting attention from isolated interventions towards the governance processes through which evidence is translated into institutional action.

From a practical perspective, the framework provides a useful reference for universities seeking to strengthen graduate outcomes through more systematic use of graduate tracer data. Rather than treating tracer studies primarily as reporting instruments, the findings show how graduate outcome evidence can be incorporated into faculty accountability, leadership review, curriculum enhancement, strategic planning, and stakeholder engagement. The framework therefore offers a governance-oriented approach that may be adapted by higher education institutions seeking to improve graduate outcomes through stronger institutional intelligence, coordinated decision-making, and continuous organisational learning.

Limitations and Future Research

This study has several limitations. First, it is based on a single explanatory case study within one Malaysian public university. Although UiTM provides an information-rich setting because of its scale, multi-campus structure, and governance complexity, the institutional arrangements examined in this study may not be directly transferable to other universities or national higher education systems.

Second, the study adopted a qualitative explanatory case-study design supported by descriptive quantitative analysis. Although multiple sources of evidence were triangulated to strengthen the credibility of the findings, the study does not establish statistical causality between the governance mechanisms examined and improvements in graduate outcomes. The observed trends should therefore be interpreted as being associated with the period of more systematic governance implementation rather than as direct causal effects.

Future research could test the applicability of the proposed framework across multiple higher education institutions and compare how different governance structures influence the use of graduate outcome intelligence. Longitudinal, mixed-method, and comparative designs may also provide stronger evidence on the relationship between institutional governance capabilities and graduate outcomes. Further studies could additionally examine the role of artificial intelligence, predictive analytics, and real-time labour market intelligence in strengthening Digital Employability Intelligence and enabling more proactive employability governance.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

References

- Arnold, K. E., & Pistilli, M. D. (2012). Course signals at Purdue: Using learning analytics to increase student success. In *Proceedings of the 2nd International Conference on Learning Analytics and Knowledge* (pp. 267-270). Association for Computing Machinery. <https://doi.org/10.1145/2330601.2330666>
- Avery, G. C., & Bergsteiner, H. (2011). Sustainable leadership practices for enhancing business resilience and performance. *Strategy & Leadership*, 39(3), 5-15. <https://doi.org/10.1108/10878571111128766>
- Bridgstock, R. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research & Development*, 28(1), 31-44. <https://doi.org/10.1080/07294360802444347>
- Bridgstock, R., & Jackson, D. (2019). Strategic institutional approaches to graduate employability: Navigating meanings, measurements and what really matters. *Journal of Higher Education Policy and Management*, 41(5), 468-484. <https://doi.org/10.1080/1360080X.2019.1646378>
- Carayannis, E. G., & Campbell, D. F. J. (2010). Triple Helix, Quadruple Helix and Quintuple Helix and how do knowledge, innovation and the environment relate to each other? *International Journal of Social Ecology and Sustainable Development*, 1(1), 41-69. <https://doi.org/10.4018/jsesd.2010010105>
- Carayannis, E. G., Grigoroudis, E., Campbell, D. F. J., Meissner, D., & Stamati, D. (2018). The ecosystem as helix: An exploratory theory-building study of regional co-opetitive entrepreneurial ecosystems as Quadruple/Quintuple Helix Innovation Models. *R&D Management*, 48(1), 148-162. <https://doi.org/10.1111/radm.12300>
- Clarke, M. (2018). Rethinking graduate employability: The role of capital, individual attributes and context. *Studies in Higher Education*, 43(11), 1923-1937. <https://doi.org/10.1080/03075079.2017.1294152>
- Daniel, B. K. (2015). Big data and analytics in higher education: Opportunities and challenges. *British Journal of Educational Technology*, 46(5), 904-920. <https://doi.org/10.1111/bjet.12230>
- DOSM. (2024). Labour Market Review, Fourt Quarter 2024. https://www.dosm.gov.my/uploads/release-content/file_20250617141849.pdf
- Hargreaves, A., & Fink, D. (2006). *Sustainable leadership*. Jossey-Bass/Wiley.
- Harvey, L. (2001). Defining and measuring employability. *Quality in Higher Education*, 7(2), 97-109. <https://doi.org/10.1080/13538320120059990>
- Ifenthaler, D., & Yau, J. Y.-K. (2020). Utilising learning analytics to support study success in higher education: A systematic review. *Educational Technology Research and Development*, 68, 1961-1990. <https://doi.org/10.1007/s11423-020-09788-z>
- International Labour Organization. (2022). *Global employment trends for youth 2022: Investing in transforming futures for young people*. <https://doi.org/10.54394/QSMU1809>

- Jackson, D. (2019). Student perceptions of the development of work readiness in Australian undergraduate programs. *Journal of College Student Development*, 60(2), 219-239. <https://doi.org/10.1353/csd.2019.0020>
- Jackson, D., & Bridgstock, R. (2021). What actually works to enhance graduate employability? The relative value of curricular, co-curricular, and extra-curricular learning and paid work. *Higher Education*, 81(4), 723-739. <https://doi.org/10.1007/s10734-020-00570-x>
- Jackson, D., & Tomlinson, M. (2020). Investigating the relationship between career planning, proactivity and employability perceptions among higher education students in uncertain labour market conditions. *Higher Education*, 80(3), 435-455. <https://doi.org/10.1007/s10734-019-00490-5>
- Long, P., & Siemens, G. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*, 46(5), 30-40.
- Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education: Evidence from recent RAND research*. RAND Corporation. <https://doi.org/10.7249/OP170>
- Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: A review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), 392-408. <https://doi.org/10.1177/0020852314564308>
- MOHE. (2025). Makro Institusi Pendidikan Tinggi. <https://www.mohe.gov.my/muat-turun/statistik/2025-1-1>
- OECD. (2021). *OECD skills outlook 2021: Learning for life*. OECD Publishing. <https://doi.org/10.1787/0ae365b4-en>
- Selwyn, N. (2019). What's the problem with learning analytics? *Journal of Learning Analytics*, 6(3), 11-19. <https://doi.org/10.18608/jla.2019.63.3>
- Tomlinson, M. (2017). Forms of graduate capital and their relationship to graduate employability. *Education + Training*, 59(4), 338-352. <https://doi.org/10.1108/ET-05-2016-0090>
- Williamson, B., Bayne, S., & Shay, S. (2020). The datafication of teaching in higher education: Critical issues and perspectives. *Teaching in Higher Education*, 25(4), 351-365. <https://doi.org/10.1080/13562517.2020.1748811>
- World Economic Forum. (2023). The future of jobs report 2023. World Economic Forum.
- Yorke, M. (2006). Employability in higher education: What it is—What it is not. Higher Education Academy.