Curriculum Mapping as a Tool for Continuous Improvement of the Business Studies (BS) Curriculum in a Digital-First University

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Abstract

In an era defined by rapid technological disruption, labour market volatility, and increasing demands for accountability in higher education, curriculum mapping emerges as a critical strategic tool for ensuring programme coherence, relevance, and quality. This paper presents a comprehensive, theoretically grounded curriculum mapping framework tailored for a digital-first institution, utilising Arden University's School of Business and Creativity as a central case study. The study synthesises existing literature to propose a robust framework for continuous improvement, demonstrates its utility through a detailed application to a contemporary business programme, and proposes evidence-based enhancements addressing the impact of Artificial Intelligence (AI). Adapting the model of Veltri et al. (2011), the proposed multi-dimensional framework systematically maps Programme Learning Outcomes (PLOs), Teaching and Learning Activities (TLAs), and Assessment Methods (AMs) against a matrix of internal attributes and external benchmarks, including QAA Subject Benchmark Statements and World Economic Forum (WEF) skills forecasts. Utilising a qualitative case study approach, the analysis reveals that while Arden University's BA (Hons) Business Management programme possesses strengths in authentic assessment, it requires stronger intentional development of future-ready skills such as AI literacy. Recommendations focus on refining PLOs, creating integrated skill threads, and pioneering AI-aware assessment strategies. This systematic approach allows institutions to move beyond static design to a dynamic model of continuous enhancement.

Keywords: Curriculum mapping, continuous quality improvement (CQI), higher education, curriculum design, digital-first education, artificial intelligence (AI).

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The Imperative for Strategic Curriculum Mapping

Background: The Challenge to Static Curricula in a Disruptive Environment

Higher education institutions in the twenty-first century operate within a landscape characterised by unprecedented velocity and unpredictability. The converging forces of accelerated globalisation, persistent labour market uncertainty, economic instability, and the relentless pace of technological advancement, most notably the rise of artificial intelligence, create a powerful and unavoidable imperative for accountability, efficiency, and transparency in academic programming. Within this volatile context, the traditional academic conception of a curriculum as a fixed, stable, and enduring entity has become fundamentally untenable. It is no longer sufficient to design a programme once and allow it to run unchanged for years; such static entities run the significant risk of rapidly losing relevance in the face of external disruption, rendering graduates ill-equipped for the modern workforce.

To address this existential challenge, universities are increasingly called upon to demonstrate that their academic programmes provide a coherent, aligned, and evolving educational experience. This experience must intentionally develop the knowledge and skills required for professional success and lifelong learning, rather than merely presenting a "bundling of credits." A robust curriculum must represent an appropriate and progressive sequencing of courses that intentionally scaffolds student learning over time, ensuring that foundational concepts are not just introduced but mastered through reiteration and increasing complexity.

This imperative for coherence is not merely pedagogical but is formalised by the rigorous standards of leading global accreditation agencies. The Association to Advance Collegiate Schools of Business (AACSB), of which Arden University is a member, emphasises that the entire process of learning assurance is rendered meaningless unless a programme's learning goals are explicitly and systematically addressed within the curriculum it delivers. While the UK's Quality Assurance Agency for Higher Education (QAA) does not utilise a single statement mirroring the AACSB's specific phrasing, its regulatory position is embodied in the function and purpose of its QAA Subject Benchmark Statements. The QAA defines national standards and expectations for specific disciplines, which universities are expected to align with to ensure consistency and quality. Consequently, a programme's curriculum and its learning outcomes must be designed and reviewed in strict alignment with these national standards, ensuring that learning goals are addressed systematically rather than haphazardly. This position aligns closely with the United States' Accreditation Board for Engineering and Technology (ABET), which mandates that a programme's curriculum must be rigorously designed to achieve each of its stated learning outcomes.

In response to these converging demands for internal coherence and external accountability, curriculum mapping has emerged as a powerful analytical methodology. As a process, it allows faculty and academic leaders to deconstruct a programme, specify its key components, arrange them in relation to one another in a visual format, and capture an overarching structure that is transparent to all stakeholders. As defined by Harden (2001), curriculum mapping provides clear, accessible information about what is taught, how it is taught, and how student performance is evaluated. This transparency is transformative; it reveals the intricate connections between different curriculum components, helps to identify critical gaps and unnecessary redundancies, and ensures that teaching methods and assessment tools are robustly aligned with broader educational objectives. When institutionalised as a recurring process rather than a one-off administrative task, curriculum

mapping becomes a cornerstone for continuous quality improvement, enabling institutions to navigate the complexities of the modern educational landscape with agility and precision.

The Strategic Context of Arden University

The necessity for a systematic and strategic approach to curriculum mapping is particularly acute for an institution with the specific profile of Arden University. Arden has explicitly defined its market position and institutional identity as being "digital-first," "innovative," and committed to a "continually evolving curriculum" that prioritises emerging professions and market disruptions. The mission of its School of Business and Creativity is to combine "traditional business disciplines with creative and innovation-driven thinking to reflect the future of enterprise, leadership, and digital-first organisations." This ambitious mission demands a curriculum that is not only contemporary in its content but also exceptionally coherent and integrated in its structure and delivery.

For Arden, a predominantly online university with a globally dispersed student body, a well-mapped curriculum is a fundamental necessity rather than a luxury. It provides the core mechanism to ensure a consistent, equitable, and high-quality student experience across diverse delivery modes and international partnerships. Without the transparency provided by a detailed curriculum map, maintaining quality control across decentralised teaching teams becomes exponentially more difficult. Furthermore, documented coherence is essential for maintaining and leveraging memberships with prestigious bodies like the AACSB, the QAA, and multiple professional accreditations from organisations such as the Chartered Management Institute (CMI), Chartered Institute of Marketing (CIM), and the Institute of Leadership and Management (ILM). The framework proposed in this paper is therefore designed to support Arden's unique institutional values of being "progressive" and "resourceful" by providing a clear methodology to harness technology and accelerate student development, ensuring it delivers the "real-world relevant" education that is central to its vision.

Literature Review

A comprehensive review of the relevant literature establishes the theoretical, practical, and strategic foundations of curriculum mapping as an essential tool for continuous improvement in higher education. This review explores the historical evolution of the practice, its deep roots in learning theory, and the human factors that influence its success.

Foundational Principles and Purpose of Curriculum Mapping

The concept of curriculum mapping as a formal process for educational improvement is not a novel invention, though its application has evolved significantly over recent decades. While Archambault and Masunaga (2015) trace its historical roots to K-12 education in the United States during the 1970s, where it was developed as a pragmatic method for teachers to inventory and align classroom content, there is sufficient evidence to show that the principles related to curriculum mapping were in use in the UK long before the term was popularised by figures like R.M. Harden in the early 2000s.

The historical roots of mapping in the UK can be traced to two distinct strands: a philosophical tradition of curriculum development and a pragmatic response to national education reform. First, the philosophical roots are evident in the "Process Model" championed by Lawrence Stenhouse in the 1970s. Stenhouse argued vehemently against a rigid, top-down, objectives-led curriculum. Instead, he viewed the curriculum as a hypothesis to be tested and refined by teachers in their own classrooms, central to his concept of the "teacher as researcher." This model encouraged teachers to systematically analyse their own

teaching practices, document the "enacted curriculum" (what was happening in the classroom), and reflect on the alignment between their intentions, their actions, and student learning. This act of critically examining, documenting, and reflecting on the curriculum in action is a direct philosophical precursor to the modern practice of curriculum mapping.

Secondly, the pragmatic driver for curriculum alignment in the UK arrived with the Education Reform Act of 1988, which introduced the National Curriculum for schools in England and Wales. This legislation represented a monumental shift that, for the first time, prescribed specific content ("Programmes of Study") and "Attainment Targets" for most subjects. This created a systemic, top-down requirement for every school to ensure their teaching covered the mandated content and demonstrated how their schemes of work aligned with the national framework. While not explicitly termed "curriculum mapping" at the time, this process of auditing teaching plans against a set of external standards to ensure coherence and coverage is functionally identical to the core mechanics of modern curriculum mapping.

In the context of higher education, the practice has been adopted as a strategic response to increasing demands from accreditation bodies, employers, and other stakeholders for demonstrable alignment between programme goals and student learning experiences. At its core, curriculum mapping is a method of collecting and analysing data about what is actually being taught to create a visual representation of the curriculum. This process makes the structure of a programme visible, allowing faculty to understand how individual courses fit together and build upon each other.

A crucial principle underpinning this process is the recognition that a single institution may simultaneously operate multiple, often misaligned, versions of its curriculum. Kopera-Frye, Mahaffy, and Svare (2008) identify four distinct curricula: the *written curriculum* (what is stated in official documents), the *taught curriculum* (what is implemented by instructors), the *learned curriculum* (what students gain), and the *assessed curriculum* (what is measured). A primary purpose of curriculum mapping is to force these four versions into alignment, ensuring that what is taught and assessed is a true reflection of the institution's stated goals. As Harden (2001) argues, an effective curriculum is synergistic, where "the whole is greater than the sum of the individual parts." The purpose is consistently identified in the literature as threefold: to comprehensively assess the existing curriculum, to facilitate its continuing review, and to support its ongoing enhancement through an evidence-based cycle of reflection and action (Veltri et al., 2011).

Theoretical Underpinnings: The Rationale for Mapping

While curriculum mapping is often viewed as an administrative process, its effectiveness is deeply rooted in established cognitive science and learning theories. The process aligns strongly with Ausubel's (1962) theory of *meaningful learning,* which posits that learning is most effective when new knowledge is integrated into an existing cognitive structure. As explored by Anastasiou et al. (2024), organising knowledge hierarchically and making relationships between concepts explicit enhances meaningful learning. A curriculum map serves as precisely this kind of "advance organiser" (Willerman & Mac Harg, 1991), visually representing the academic journey and helping students see the relevance of individual topics to their overall development.

The visual clarity of a map also connects directly to *cognitive load theory* ***(CLT)*** (Sweller, 1994). CLT suggests that working memory is limited and that instructional design should aim to reduce extraneous cognitive load, the mental effort required to process information that is not essential to the learning task itself. A disjointed, incoherent curriculum imposes a high extraneous cognitive load on students, who must expend precious mental

energy trying to forge connections between isolated courses that are not made explicit. A well-mapped curriculum, with its clear pathways and logical sequencing, provides a higher degree of organisation that assists students in building mental schemas, thereby reducing cognitive load and freeing up working memory for deeper learning.

This leads to the principle of *constructive alignment* (Biggs, 2003), a cornerstone of modern curriculum design. As detailed by Livingstone (2014), constructive alignment demands unity between the Intended Learning Outcomes (ILOs), the Learning and Teaching Activities (LTAs), and the Assessment Tasks (ATs). The "constructive" aspect is based on the theory that students construct meaning from what they do to learn; the "alignment" aspect refers to the instructor's role in creating a learning environment where those activities are explicitly aligned with achieving the ILOs. Curriculum mapping is the primary tool used to visualise and verify this alignment. It ensures that the verbs used in the ILOs (e.g., "analyse," "create") are activated in the LTAs and are the explicit focus of the ATs, pushing students towards a deep approach to learning.

Finally, the process of curriculum mapping is underpinned by *constructivist learning theory*, particularly the social constructivism of Vygotsky (1978). This theory posits that learners build new knowledge through social interaction and collaboration. As Bull (2025) notes, engaging learners in the active organisation of concepts aligns directly with constructivist principles. When implemented through collaborative faculty workshops, the curriculum mapping process becomes a powerful form of professional learning where educators collectively construct a shared understanding of the curriculum and co-create solutions.

The Process as a Catalyst for Continuous Improvement

The literature consistently frames curriculum mapping not as a static audit but as a dynamic, cyclical process for continuous improvement. The map should be a "living document that is updated and assessed regularly" (Joyner, 2016a; Okojie et al., 2022). This iterative cycle involves identifying gaps and redundancies (Joyner, 2016a; Okojie et al., 2022), formulating evidence-based recommendations, implementing changes, and then re-evaluating the impact, a process known as "closing the loop" (Ebel et al., 2020; Joyner, 2016a). A key part of this analysis is ensuring both vertical ('⇳') coherence (the progressive scaffolding of learning using a taxonomy like "Introduced, Reinforced, Mastered") and horizontal ('⇔') coherence (the integration of learning across courses at the same level). Figure 3 operationalises both concepts within the case study matrix, where the I–R–M progression is read vertically (top to bottom across levels), while the horizontal coherence indicators identify where horizontal integration is strong or at risk. This scaffolding is often discussed in terms of a spiral curriculum, where students revisit topics at increasing levels of difficulty, allowing them to deepen their learning and apply it in new contexts (Lam & Tsui, 2013).

Evaluation Against the Arden University Model

The reviewed literature provides a robust foundation for evaluating the role of curriculum mapping within the specific context of Arden University. For a digital-first, geographically dispersed institution, the transparency and consistency afforded by a comprehensive map are not merely beneficial but essential for quality assurance and the delivery of an equitable student experience. The map provides a central, shared understanding that ensures all tutors are working towards the same learning goals. Arden's commitment to a "continually evolving curriculum" is directly enabled by the continuous improvement cycle at the heart of the mapping process (Veltri et al., 2011). Furthermore, the imperative for

Arden to prepare students for a future shaped by AI makes mapping a critical strategic tool for planning and verifying the systematic integration of these new skills across the curriculum (Alam & Benaida, 2022). Finally, innovative approaches like the "virtual courses" concept described by Bateman et al. (2015) offer a pragmatic strategy, aligned with Arden's innovative identity, for tracking cross-cutting digital and professional skills across the programme without requiring major structural redesign.

Methodology

This study employs a qualitative, descriptive case study methodology to develop, apply, and refine a comprehensive framework for curriculum mapping within a specific institutional context. The overarching research paradigm is interpretive, seeking to generate a deep, contextualised understanding of a complex, real-world phenomenon rather than producing generalisable statistical findings (Yin, 2018). A case study approach is particularly appropriate for this research as it excels at providing an in-depth, holistic analysis of a specific, bounded system, in this instance, the curriculum of the BA (Hons) Business Management programme at Arden University. This method is ideal for answering the "how" and "why" questions that are central to this paper: namely, how can a curriculum mapping framework be designed for a digital-first university, and why is such a framework a critical tool for continuous improvement in the current higher education landscape? (Arafeh, 2016). The research design is not intended to test a hypothesis in the positivist sense, but rather to construct a rich, evidence-based argument through a multi-stage process of theoretical synthesis and detailed documentary analysis.

Research Design: A Multi-Stage Approach

The research was conducted using a four-stage qualitative design that integrates theoretical framework development with practical application through systematic documentary analysis, as illustrated in Figure 1. This approach ensures that the resulting framework is both grounded in established scholarship and directly relevant to the practical challenges of the case under investigation.

Figure 1

Figure 1 Multi-Stage Qualitative Research Design. Source: Author's own conceptualisation.

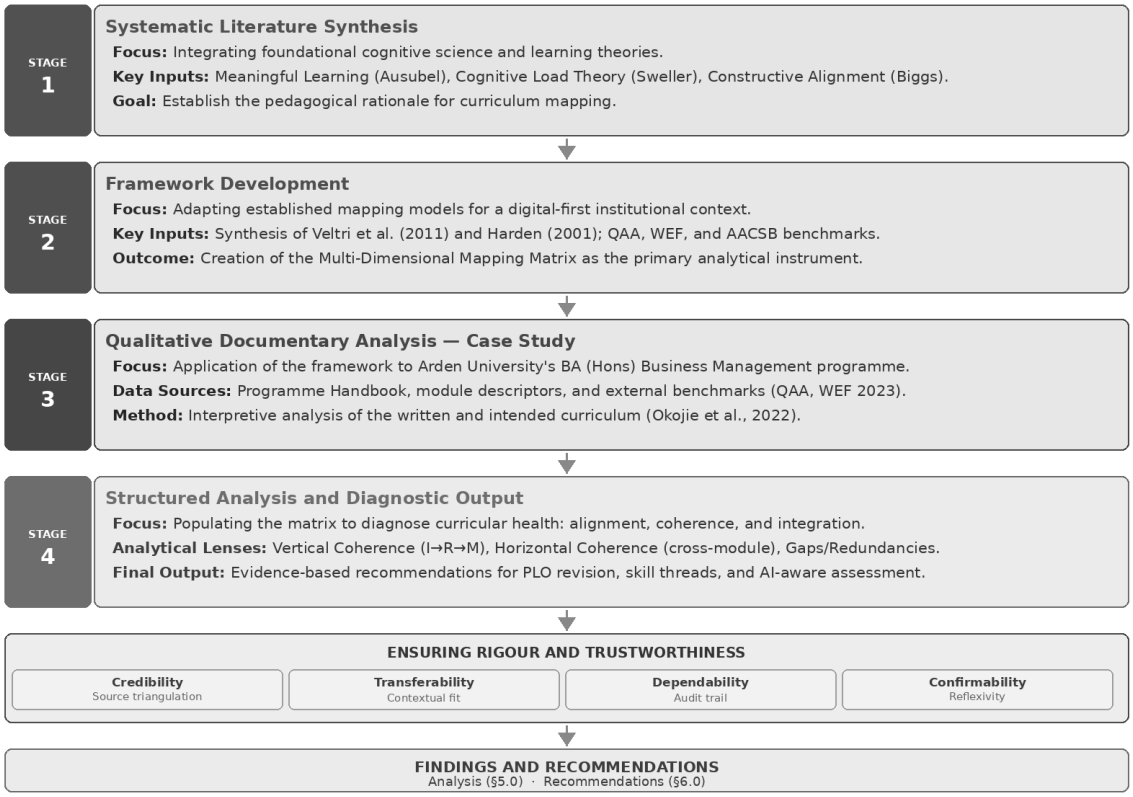

Figure 1. Multi-Stage Qualitative Research Design.
Source: Author's own conceptualisation.

Stage 1: Systematic Literature Synthesis. The initial stage involved a systematic and thematic review of the literature to synthesise a best-practice theoretical framework. This process drew heavily on foundational models for continuous improvement cycles presented by Veltri et al. (2011) and the faculty-centric perspectives offered by researchers such as Joyner (2016a, 2016b) and Rawle et al. (2017). The theoretical underpinnings of the framework were strengthened by integrating insights from the literature on cognitive science and constructivism, particularly regarding meaningful learning, cognitive load, and constructive alignment (Anastasiou et al., 2024; Bull, 2025; Livingstone, 2014). This rigorous synthesis resulted in the creation of the comprehensive framework detailed in Section 4.0, which serves as the primary methodological and analytical instrument for this study.

Stage 2: Framework Development. Building on the Stage 1 synthesis, the second stage focused on framework development, by adapting established mapping models specifically for a digital-first institutional context. This involved synthesising the models of Veltri et al. (2011) and Harden (2001) with the QAA Subject Benchmark Statement (2023), WEF Future of Jobs forecasts (2023), and AACSB guidance on AI literacy. The primary outcome of this stage was the creation of the multi-dimensional mapping matrix, the analytical instrument described in detail in Section 4.2 and illustrated in Figure 3, which served as the central tool for all subsequent analysis.

Stage 3: Qualitative Documentary Analysis—Study. The third stage applied the framework developed in Stage 2 to the specific case of Arden University's BA (Hons) Business Management programme. Employing a qualitative documentary analysis approach,

this stage treated programme documents not as objective truths but as social artefacts created within an organisation to serve specific purposes (Atkinson & Coffey, as cited in Okojie et al., 2022). The data consisted of publicly available documents, the programme handbook, module descriptors, and external benchmarks (QAA, 2023; WEF, 2023), which were systematically analysed using the multi-dimensional mapping matrix as the primary interpretive lens, as depicted in Figure 3.

Stage 4: Structured Analysis and Diagnostic Output. The final stage involved the structured analysis of the populated matrix to produce a diagnostic output regarding the programme's curricular health. This stage examined the data through three analytical lenses: alignment with external benchmarks (QAA and WEF), vertical coherence (the progressive scaffolding of skills using the *introduced–reinforced–mastered* framework across Levels 4, 5, and 6), and horizontal coherence (the integration of transferable skills across modules at the same level). The findings of this diagnostic analysis, presented in Section 5.0, form the evidence base from which the strategic recommendations in Section 6.0 are logically and transparently derived.

Data Sources and Selection Criteria

A purposive selection of documents was used to inform both the framework development and the case study analysis. The credibility of a documentary analysis rests on the authenticity and relevance of the chosen sources (Okojie et al., 2022). The sources for this study fall into three main categories, each selected to serve a specific function in the research design.

The first category consists of the *primary academic literature* provided for the study. The core of the research is built upon a detailed review of peer-reviewed articles that form the scholarly conversation around curriculum mapping. Key sources included Veltri et al. (2011) for its comprehensive IS model; Joyner (2016b) for its empirical insights into faculty perceptions and resistance; Anastasiou et al. (2024) for its theoretical discussion of learning principles; Rawle et al. (2017) for its analysis of cross-disciplinary differences; and Saad (2014) and Kopera-Frye et al. (2008) for their practical perspectives on implementation. These sources were selected for their direct and scholarly relevance to curriculum mapping theory and practice.

The second category comprises *grey literature and external benchmarks*. To ensure the framework's relevance and alignment with current professional and quality standards, key "grey literature" sources were analysed. These included the QAA Subject Benchmark Statement for Business and Management (2023), the World Economic Forum's Future of jobs report 2023 [Report], and guidance on AI in business education from the AACSB. These documents, while not peer-reviewed in the traditional sense, represent authoritative external standards and industry forecasts against which a modern UK business curriculum must be benchmarked.

The third category is the *case study documents*. The specific application of the framework relied on the analysis of documents pertaining to Arden University. These included the BA (Hons) Business Management Programme Handbook, publicly available module descriptions, and strategic statements published on the university's website. These documents were selected as they provide the necessary data on the "written curriculum," including Programme Learning Outcomes (PLOs), course structures, and assessment strategies for the case study analysis.

Data Analysis: The Mapping Process as an Analytical Tool

The analysis of the collected documents was conducted in a structured manner, using the proposed curriculum mapping framework as the primary analytical tool. The literature itself was subjected to a *thematic synthesis,* where arguments and findings from different sources were grouped into the key themes presented in the literature review (Section 2.0), such as foundational principles, theoretical underpinnings, and implementation challenges. This approach allowed for a deeper and more integrated understanding of the scholarly conversation.

For the case study application, the primary analytical instrument was the master curriculum map matrix. This matrix functions as a tool for conducting a structured qualitative content analysis of the curriculum documents (Arafeh, 2016). The analysis involved a conceptual "populating" of the matrix based on the information contained within the programme handbook and module guides. This diagnostic process was guided by a set of specific analytical questions derived from the literature on curricular coherence (Hatzakis et al., 2007) and programme assessment (Ebel et al., 2020):

a) **Alignment:** Are the Programme Learning Outcomes aligned with external benchmarks (QAA, WEF) and internal institutional attributes?

b) **Vertical Coherence:** Is there evidence of progressive scaffolding, with skills being clearly Introduced, Reinforced, and Mastered across the levels of the programme?

c) **Horizontal Coherence:** Are key transferable skills integrated across different modules at the same level, or do they exist in isolated "silos"?

d) **Gaps and Redundancies:** Are there significant gaps where key outcomes or skills are not adequately addressed? Conversely, are there redundancies where content is repeated without adding value or complexity?

e) **Strategic Integration:** Is the integration of critical cross-curricular themes, particularly Artificial Intelligence, intentional, systematic, and progressive?

The findings of this structured analysis, presented in Section 5.0, form the evidence base from which the final recommendations are logically and transparently derived.

Ensuring Rigour and Trustworthiness

In line with qualitative research principles, the rigour of this study is addressed through the concept of trustworthiness, which encompasses credibility, transferability, dependability, and confirmability.

Credibility is established primarily through the *triangulation of sources*. The proposed framework is not based on a single author's opinion but is a synthesis of multiple peer-reviewed academic papers, professional body guidelines, and institutional documents. This triangulation ensures that the framework is robust and well-grounded in a broad range of evidence.

Transferability refers to the extent to which the findings can be applied to other contexts. While the specific findings are context-bound to the Arden University case, the detailed description of the methodological process and the synthesised framework itself are designed to be transferable. Other institutions can adapt this framework and analytical

process to their own programmes, achieving what Yin (2018) refers to as "analytical generalisation" rather than statistical generalisation.

Dependability and **Confirmability** are addressed through the transparency of the research process. This paper explicitly lays out the research design, the data sources, the structure of the analytical framework, and the steps taken to analyse the case study documents. This creates a clear "audit trail," allowing the reader to follow the logic from the initial data sources through to the final conclusions and recommendations, ensuring the findings are grounded in the evidence presented. Finally, a degree of reflexivity is maintained by acknowledging that the analysis represents an interpretation of the documents, and the structured, evidence-based nature of the methodology is employed to mitigate personal bias and ensure the argument is built upon a solid scholarly foundation.

A Proposed Framework for Curriculum Mapping and Continuous Improvement

This section details the comprehensive curriculum mapping framework proposed for Arden University's School of Business and Creativity. The framework is not presented as a rigid prescription, but as a dynamic and adaptable methodology for continuous quality improvement. It represents a deliberate synthesis of best practices identified in the literature, adapting the foundational models of Veltri et al. (2011) and Harden (2001) for the specific context of a contemporary, digital-first higher education institution. The framework is designed to be a vehicle for collaboration, a tool for strategic planning, and a mechanism for ensuring that the curriculum remains aligned, coherent, and resilient in the face of ongoing technological and societal change. It is structured around two core elements: a multi-layered architectural model of the curriculum's components and a systematic, five-step cyclical process for its implementation and review.

Framework Architecture: Components of a Coherent Curriculum

To effectively analyse a curriculum, it must first be deconstructed into its core components. This framework is built upon four interconnected architectural elements: programme learning outcomes (PLOs), course-level learning outcomes (CLOs), teaching and learning activities (TLAs), and assessment methods (AMs). The systematic exploration of the relationships between these four components is the key to ensuring alignment, from the highest-level programme goals down to the specific activities and assessments in each module. Figure 2 provides a visual overview of how these components are architecturally connected within the proposed framework.

Figure 2

Components of a Coherent Curriculum — The Framework Architecture. (Source: Author's own conceptualisation.)

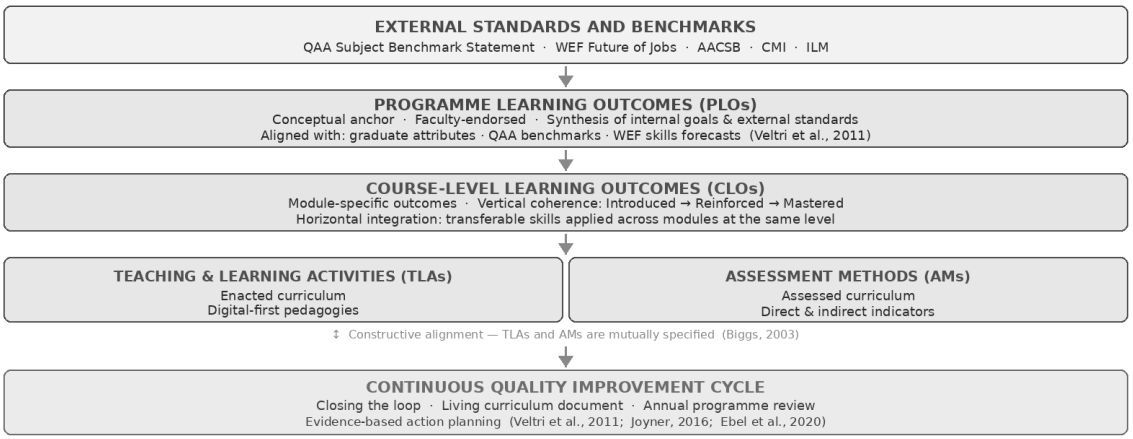

Figure 2. Components of a Coherent Curriculum — The Framework Architecture.
Source: Author's own conceptualisation.

Programme learning outcomes (PLOs) serve as the conceptual anchor for the entire mapping process. These are the high-level statements describing the integrated knowledge, skills, and attributes a graduate is expected to possess upon completion of the programme. For these outcomes to be effective, the literature suggests they must be a synthesis of internal institutional goals and external quality and industry benchmarks (Ebel et al., 2020; Oliver et al., 2007). In the context of Arden University, this means the PLOs should represent a clear alignment between the university's own graduate attributes, the national standards defined in the QAA Subject Benchmark Statement for Business and Management (2023), and the future-of-work skills identified by global bodies like the World Economic Forum (2023). Well-developed, faculty-endorsed statements of intended programme learning outcomes provide the coherent and defensible starting point from which all subsequent analysis proceeds (Veltri et al., 2011).

Course-level learning outcomes (CLOs) are the more granular, specific, and demonstrable outcomes defined for each individual module. While PLOs describe the graduate, CLOs describe what a student will be able to do at the end of a specific course. The mapping process critically examines the vertical and horizontal alignment of these CLOs, ensuring that each one contributes intentionally and progressively to one or more of the overarching PLOs. This creates a clear line of sight, allowing faculty and students to understand the purpose of each course within the broader programme structure.

Teaching and learning activities (TLAs) represent the "taught" or "enacted" curriculum, the pedagogical methods and tools used to deliver course content and facilitate the development of student skills (Kopera-Frye et al., 2008). In a well-aligned curriculum, TLAs are not arbitrary; they are intentionally designed to engage students in the specific activities that will enable them to achieve the stated learning outcomes. This principle is the heart of *constructive alignment,* which argues that learning is constructed by what the student does, and therefore the TLAs must activate the same verbs as the learning outcomes (Livingstone, 2014; Biggs, 2003). For Arden's digital-first context, this component would include a rich mix of online collaborative exercises, case study analyses, and the use of advanced tools like business simulation software.

Assessment methods (AMs) constitute the "assessed curriculum" (Kopera-Frye et al., 2008) and are the instruments used to measure and provide evidence of student achievement. In an aligned system, assessment tasks are not separate from the learning process but are an integral part of it, designed to allow students to demonstrate their mastery of the ILOs (Livingstone, 2014). This framework embraces Arden's commitment to authentic, non-exam-based assessments, but stresses that each assessment must be explicitly mapped back to the outcomes it purports to measure. Furthermore, the framework incorporates the distinction between direct indicators of learning (e.g., student performance in specific assignments) and indirect indicators (e.g., student exit surveys or employer feedback), both of which are essential for a holistic evaluation of the curriculum's effectiveness (Ebel et al., 2020).

The Analytical Instrument: The Multi-Dimensional Mapping Matrix

The central instrument of this framework is the *master curriculum map matrix*. It functions as a visual representation (Joyner, 2016a), a graphic portrayal (Kopera-Frye et al., 2008), and a data recording tool (Veltri et al., 2011) that makes the entire curriculum transparent. Its structure is intentionally more complex than a simple two-dimensional map, designed to capture the multiple layers of outcomes and standards that a modern business programme must meet. In this matrix, the programme's courses and other key experiences are listed as rows, while the various outcomes and external benchmarks are listed as columns. A representative example of this matrix, populated with data from the Arden University case study, is presented in Figure 3.

Figure 3

Multi-Dimensional Mapping Matrix — BA (Hons) Business Management Programme. I = Introduced; R = Reinforced; M = Mastered. ↕ = Vertical coherence; ↔ = Horizontal coherence; ⚠ = Gap/integration risk. [Source: Author's own mapping, adapted from Veltri et al. (2011); aligned with QAA (2023) and WEF (2023)].

Module	Lvl	PLO 1 Business	PLO 2 Critical	PLO 3 Digital	PLO 4 Comm.	PLO 5 Ethics	QAA Bench.	WEF Skills	Coherence Indicator
Level 4 — Introduction (I = skills first encountered)									
BUS4012 Business Finance	4	I	I	—	I	—	I	—	↕ Intro ⚠ No digital
BUS4013 Technology & Innovation	4	—	I	I	I	I	I	I	↕ Intro ↔ Linked L4
Level 5 — Development & Reinforcement (R = skills applied across modules)									
BUS5015 Data Analytics & Mgmt	5	R	R	R	—	—	R	R	↕ R from L4 ⚠ Silo risk
BUS5016 Business Start-up	5	R	R	—	R	—	R	R	↕ R from L4 ↔ Partial
BUS5023 Digital & Social Media	5	R	R	R	R	—	R	R	↕ R from L4 ⚠ Gap: PLO3
Level 6 — Mastery & Integration (M = skills demonstrated at programme level)									
BUS6009 Intl Business Mgmt	6	M	M	R	M	—	M	M	↕ M: PLO1-2 ↔ Strong
BUS6010 Strategic Management	6	M	M	R	M	M	M	M	↕ Full M ↔ Strong
BUS6012 Governance, Law & Ethi	6	—	M	R	M	M	M	R	↕ M: PLO2 ⚠ PLO5 gap

I = Introduced R = Reinforced M = Mastered — = Not mapped ↕ Vertical coherence ↔ Horizontal coherence ⚠ Gap/integration risk

Figure 3. Multi-Dimensional Mapping Matrix — BA (Hons) Business Management Programme.
Source: Author's own mapping, adapted from Veltri et al. (2011); aligned with QAA (2023) and WEF (2023).

The power of this matrix lies in its multi-dimensional nature. It allows curriculum committees to move beyond asking "Is this topic covered?" to asking far more sophisticated, strategic questions. For example, it enables an analysis of how a single module, such as 'Project Management', contributes not only to its own CLOs but also simultaneously to a university-wide Graduate Attribute (e.g., 'Effective Communication'), a professional body competency (e.g., CMI's 'Project Leadership'), and a future-focused skill identified by the WEF (e.g., 'Leadership and social influence'). This provides a powerful analytical view essential for strategic curriculum management, accreditation, and communicating the value of the programme to students (Archambault & Masunaga, 2015).

The Process: A Five-Step Cycle for Continuous Improvement

Implementing the framework involves a systematic, cyclical process designed to foster professional dialogue and lead to tangible curriculum enhancements. This five-step cycle adapts the models proposed by Veltri et al. (2011) and others, emphasising a collaborative and evidence-based approach.

Step 1: Defining outcomes and external benchmarks. The cycle begins with the critical task of establishing a clear, measurable, and robust set of PLOs. As Veltri et al. (2011) caution, unless the outcomes are developed and agreed upon by programme faculty, the entire mapping exercise risks being meaningless. This stage involves not only internal deliberation but also a thorough analysis of external benchmarks, including QAA statements and professional body requirements, to ensure the programme's external validity and relevance.

Step 2: Collaborative mapping and data collection. This stage involves faculty convening in collaborative workshops to populate the master curriculum map matrix. This process is crucial not only for accurate data entry but, more importantly, for promoting the professional dialogue that lies at the heart of curriculum improvement (Joyner, 2016b). While course syllabi serve as the primary data source for the "intended" and "communicated" curriculum (Arafeh, 2016), the faculty dialogue during these workshops is essential for capturing a more accurate picture of the "enacted" curriculum, what actually happens in the classroom.

Step 3: Analysis and diagnosis of the map. Once populated, the map is systematically analysed to diagnose the health of the curriculum. This is the core analytical phase, where the committee looks for specific patterns. This includes identifying gaps, where PLOs or key skills are under-addressed, and redundancies, where concepts are repeated without progression. It is crucial here to distinguish between harmful redundancy and desirable reinforcement within a spiral curriculum (Joyner, 2016a; Lam & Tsui, 2013). The analysis also focuses on identifying misalignments between the stated level of instruction and the associated assessments, as well as skill silos, which indicate a lack of horizontal integration.

Step 4: Evidence-based action planning. This stage involves translating the diagnosis from the map into specific, actionable recommendations for improvement. Crucially, this is not based on the map alone. As recommended by Ebel et al. (2020), the findings from the map should be triangulated with other sources of evidence, such as direct assessment data from student work and indirect assessment data from student satisfaction surveys, alumni feedback, and employer interviews. This ensures that the resulting action plan is holistic and evidence-based.

Step 5: Closing the loop—Integration with quality cycles. The final and most critical step is to ensure the curriculum map does not become a static document. It must be institutionalised as a "living document" that is integrated into formal quality assurance processes, such as annual programme review (Joyner, 2016a). This step "closes the loop" by using the outcomes of implemented changes and new assessment data to validate or challenge the map, which then becomes the starting point for the next iteration of the continuous improvement cycle (Ebel et al., 2020).

Application and Analysis: A Case Study of Arden University's Business Studies Programme

This section presents the analytical core of the study, detailing the application of the comprehensive curriculum mapping framework (outlined in Section 4.0) to the specific case of Arden University's BA (Hons) Business Management programme. The analysis is based on a qualitative documentary analysis of the publicly available programme handbook and associated module descriptors. The framework is employed here as a diagnostic tool to evaluate the programme's alignment with external benchmarks, to assess its internal coherence, and to critically examine its strategic integration of contemporary themes, particularly artificial intelligence (AI). The findings are presented not merely as a report of data, but as an interpretive analysis that connects the structure of the curriculum back to the theoretical principles and practical challenges identified in the literature review.

Analysis of Programme Learning Outcomes (PLOs): Benchmarking Against External Standards

The first stage of the analysis involves a critical evaluation of the programme's stated Programme Learning Outcomes (PLOs), which serve as the "conceptual anchor for the mapping exercises." A robust set of PLOs must reflect a synthesis of internal institutional goals and external quality and industry benchmarks. A comparative analysis of the BA (Hons) Business Management programme's existing PLOs against the UK's Quality Assurance Agency (QAA) *Subject Benchmark Statement for Business and Management (*2023) and the top skills identified in the World Economic Forum's (WEF) *Future of Jobs Report 2023* reveals a solid foundation in core business functions, but also significant opportunities for strategic enhancement.

The current PLOs demonstrate a strong alignment with the traditional knowledge areas expected of a business degree, such as understanding key business functions and the external environment, which are consistent with the QAA benchmarks. However, the analysis reveals that the PLOs are less explicit in articulating the higher-order cognitive skills and future-focused competencies that are now central to both the revised QAA statement and the WEF report. For instance, while PLO 7 mentions "critical thinking," the WEF's more nuanced distinction between "analytical thinking" and "creative thinking" is not explicitly captured. This lack of specificity can lead to ambiguity in curriculum design and assessment.

Most notably, the analysis identifies a significant gap, in that there is no explicit mention in the PLOs of AI, advanced data analytics, or sustainability as core, named competencies for graduates. Given the WEF (2023) identifies "AI and big data" and "Technological literacy" as top-priority skills, their absence from the programme's highest-level outcome statements is a strategic weakness, particularly for an institution with a "digital-first" mission. Leading bodies like the AACSB (2023) are now advocating for an "inclusive AI literacy" that combines technical skills with a deep understanding of ethical considerations. Without an explicit PLO mandating this, the development of such a critical, cross-curricular competency is left to chance rather than being systematically designed. The language of the PLOs could be substantially strengthened to better reflect the expectation that graduates will not just understand but critically evaluate, innovate, and lead in a technology-driven and ethically complex world.

Diagnosing Curricular Coherence: A Conceptual Heat Map Analysis

As illustrated in Figure 3, the application of the multi-dimensional mapping matrix to the programme's structure allows for a conceptual "heat map" analysis to diagnose its internal coherence. This process involves visually mapping where PLOs and key skills are

introduced (I), *reinforced* (R), and m*astered* (M) across the sequence of core modules; the Coherence Indicator column on the right of the matrix makes explicit where vertical scaffolding is strong, where horizontal integration is present, and where gap risks have been identified. This analysis reveals a curriculum with considerable strengths in vertical coherence but significant weaknesses in horizontal integration.

The programme demonstrates strong *vertical coherence* in its foundational subject areas. For example, a student's journey in understanding financial principles can be clearly traced. The concept is likely "Introduced" at Level 4 in a module like *BUS4012 Introduction to Business Finance*, "Reinforced" at Level 5 where it is applied in a module such as *BUS5016 Business Start-up* and finally integrated and applied at a strategic level for "mastery" in a Level 6 capstone module. This progressive scaffolding aligns with the principles of a spiral curriculum, where topics are revisited at increasing levels of difficulty to deepen learning. This structure provides a clear and logical pathway for student development in core disciplinary knowledge.

However, the analysis also points to a significant challenge in *horizontal integration*, a common issue where learning becomes siloed within individual modules. For instance, the crucial skills taught in the Level 5 module *BUS5015 Data Analytics & Management* risk becoming an isolated "hot spot" of competence. The mapping process forces the critical question, which is, "Are students then required to apply these data analysis skills in their other Level 5 and Level 6 modules, such as *BUS5023 Digital & Social Media Marketing* or *BUS6009 International Business Management?"* If the map reveals that these skills are taught and assessed in one module but not explicitly drawn upon or required in others at the same level, it indicates a lack of horizontal integration. This prevents students from developing the ability to transfer and apply their learning in new and varied contexts, a core goal of higher education. In such a scenario, the curriculum functions more as a collection of discrete, valuable topics rather than a truly integrated programme designed to build cumulative, transferable capability, failing to meet Harden's (2001) ideal of a curriculum where the "whole is greater than the sum of the individual parts."

Analysis of Strategic AI Integration: From Isolation to Infusion

A targeted audit of the curriculum's engagement with artificial intelligence, a theme critical to Arden's mission, reveals a structural issue of isolation rather than infusion. The current module list suggests that technology topics are concentrated in specific courses like *BUS4013 Technology & Innovation*. While such modules are valuable, this structure risks positioning AI as a specialised topic rather than integrating it as a foundational, cross-cutting tool and competency, a key recommendation from leading business schools. A future-ready curriculum would see AI principles applied not just in technology modules, but also in marketing (e.g., AI-driven consumer analytics), finance (e.g., algorithmic trading), and HR (e.g., AI in recruitment).

This isolation also impacts the treatment of ethics. While a module like *BUS6012 Governance, Law & Ethics* provides a natural home for discussing the societal implications of technology, separating this discussion from the technical and strategic application of AI is a missed opportunity. The ethical dimensions of AI, such as algorithmic bias and data privacy, are most powerfully understood when they are confronted directly within the contexts where the tools are being used. Finally, the analysis reveals a lack of clear, progressive skill development in AI literacy. Best practice suggests that students should be scaffolded from simple tasks (e.g., using generative AI for brainstorming in a Level 4 module) to more advanced applications (e.g., using AI for data analysis or critically evaluating AI-generated strategies in a Level 6 project). The current structure does not make this developmental

pathway explicit. This points to a fundamental disconnect between having modern module titles and achieving the systematic, progressive development of the underlying digital and AI competencies throughout the entire student journey. The curriculum must be redesigned to treat AI as a fundamental competency and a "partner" for thought, not just a topic of study (Veltri et al., 2011).

Recommendations and Implications

The application of the curriculum mapping framework to Arden University's BA (Hons) Business Management programme, as detailed in the preceding analysis, provides a clear, evidence-based foundation for a series of actionable recommendations for programme enhancement. The overarching finding is that while the programme possesses a strong vertically coherent structure and a commitment to authentic assessment, significant opportunities exist to enhance its horizontal integration, strategic alignment with external benchmarks, and its pedagogical approach to emerging technologies, particularly Artificial Intelligence. The following recommendations are therefore designed not as minor adjustments, but as a strategic roadmap for evolving the curriculum to fully meet the demands of a digital-first educational mission. The implications of this analysis extend beyond the single case, offering a model for how similar institutions can approach continuous, evidence-based curriculum improvement.

Recommendation: Enhance Programme Design Through PLO Articulation

The analysis revealed that while the current Programme Learning Outcomes (PLOs) provide a solid foundation in core business functions, they lack the specificity and ambition required to drive the development of future-focused competencies. As Veltri et al. (2011) argue, PLOs serve as the "conceptual anchor" for the entire curriculum; if critical skills like AI literacy, advanced data analytics, and sustainability are not explicitly articulated at this highest level, their development within the programme's modules will likely remain inconsistent and ad-hoc.

Therefore, the first and most fundamental recommendation is to revise the BA (Hons) Business Management PLOs to be more explicit about higher-order cognitive skills and strategic themes. This revision should be directly informed by the key external benchmarks identified in this study. The language should be sharpened to reflect the expectation of critical evaluation, innovation, and leadership, drawing directly from the QAA Subject Benchmark Statement for Business and Management (2023) and the skills forecast of the World Economic Forum (2023). For example, a revised PLO might state; "Critically evaluate and apply emerging technologies, including AI and data analytics, to generate innovative and ethical solutions to complex business problems." A similarly revised outcome focused on sustainability could be introduced. This stronger articulation provides a clearer and more ambitious target for the entire curriculum, establishing an unambiguous mandate for course designers and ensuring that programme design is driven by explicit, relevant, and measurable goals, a core principle of accreditation bodies like the QAA and AACSB.

Recommendation: Optimise Course Design by Creating Integrated "Skill Threads"

A primary finding of the analysis was the identification of "skill silos," where critical competencies are taught in isolated modules, leading to weak horizontal integration. To address this, the curriculum should be intentionally restructured to create clear, integrated "threads" for these transferable skills, particularly data analytics and AI literacy. This involves a systematic plan to ensure these skills are explicitly Introduced at Level 4, Reinforced and applied across multiple disciplinary contexts at Level 5, and required for Mastery in Level 6 capstone modules, which is a progression made visible in Figure 3, where

the coherence indicator column identifies PLO 3 (digital literacy) as presenting a horizontal integration gap at Level 5 that this restructuring directly addresses. This approach directly operationalises the concept of a spiral curriculum, where students revisit concepts with increasing complexity to deepen their learning (Lam & Tsui, 2013).

This would transform the curriculum from a collection of discrete topics into an integrated learning journey that fosters more transferable competence (Harden, 2001). For instance, after being introduced to data analytics techniques in *BUS5015*, students should then be explicitly required to apply those techniques in their marketing plans in *BUS5023* and in their strategic analyses in *BUS6010*. This would require a coordinated effort among module leaders to design assignments that build upon prior learning, a collaborative process that the curriculum map itself is designed to facilitate (Joyner, 2016b). Such an approach ensures that the "whole of the curriculum is greater than the sum of the individual parts" (Harden, 2001) and moves students from simply knowing a skill to being able to use it flexibly and confidently.

Recommendation: Innovate Assessment to Be AI-Aware and AI-Centric

The analysis highlighted that for a digital-first university, the most critical pedagogical shift required is in its approach to assessment in the age of AI. Therefore, it is recommended that Arden's authentic assessment strategy be evolved to be explicitly AI-aware and AI-centric. This requires moving beyond a defensive posture of trying to "AI-proof" assignments and instead designing assessments that actively leverage AI to foster and measure the higher-order thinking skills that are now more important than ever. This is a direct application of the principle of *constructive alignment* (Biggs, 2003; Livingstone, 2014); if the new PLOs require students to "critically evaluate" the use of AI, then the Assessment Tasks (ATs) must be designed to elicit and measure that specific skill.

This can be achieved through several innovative assessment designs. One such design is the *AI-Assisted Strategy Development* task. In this assignment, students would use a generative AI tool to brainstorm multiple strategic options for a business problem. The student's assessed work would not be the AI output, but a subsequent report that critically evaluates the AI-generated options, identifies their strengths and weaknesses using external evidence, and provides a reasoned justification for selecting and refining the most viable strategy. A second design is the *AI Output Critique*, where students are provided with an AI-generated business report and are tasked with identifying inaccuracies, logical fallacies, biases, and "hallucinations," and then producing a corrected and improved version. A third critical component would be a *Mandatory Process Reflection*, requiring students to submit a statement disclosing which AI tools they used and critically reflecting on how AI shaped their analysis and conclusions. These assessments shift the focus from the simple production of content to the metacognitive and critical skills essential for ethical and effective technology use in the workplace.

Recommendation: Institutionalise the Mapping Process for Sustainable Improvement

For any of these enhancements to be sustainable, the process of curriculum mapping must be embedded within the university's quality culture. Therefore, a final key recommendation is that the *Master Curriculum Map Matrix* be formally adopted as a core governance document within the School of Business and Creativity's annual programme review and quality assurance cycle. This ensures that curriculum mapping is not a one-off project but becomes a sustainable, embedded practice for continuous improvement, as Veltri et al. (2011) intended.

As the literature on implementation challenges makes clear, faculty buy-in is essential and can be difficult to maintain if the process is perceived as a burdensome, top-down mandate (Joyner, 2016b). By institutionalising the map as a central tool for all curriculum discussions, it becomes an indispensable part of the professional dialogue. It ensures that decisions about programme changes are always evidence-based and strategically aligned with internal goals and external benchmarks. This creates a "living document" and formally "closes the loop" of the assessment cycle (Ebel et al., 2020; Joyner, 2016a), providing the mechanism for the curriculum to remain agile and responsive to future changes in technology, industry, and accreditation standards.

Implications for Practice and Future Research

The implications of this study extend beyond the specific recommendations for the Arden University programme. Firstly, for Arden and similar digital-first institutions, this research provides a clear model for how to move from a curriculum that simply includes digital topics to one that is holistically designed for a digital world. It highlights that true digital transformation in education is a matter of curriculum structure and pedagogical strategy, not just technological tools. Secondly, the proposed framework is highly transferable. Other higher education institutions, particularly those undergoing accreditation review or strategic renewal, can adopt this methodology to conduct their own evidence-based analysis. The process of synthesising external benchmarks, mapping internal coherence, and fostering faculty dialogue is a universal model for effective curriculum governance.

Finally, this study points to several avenues for future research. An empirical study could be conducted to measure the impact of implementing these recommendations on student performance, engagement, and perceptions of work-readiness. Longitudinal research could track how the development of "skill threads" affects long-term knowledge retention and transfer. Furthermore, as AI-aware assessments are implemented, research will be needed to evaluate their effectiveness and to develop reliable and valid methods for assessing the new and complex skills they target. Such research will be critical as higher education continues to navigate its relationship with artificial intelligence.

Conclusion and Future Directions

Synthesis of the Argument and Key Findings

This paper addressed the critical challenge facing higher education institutions, particularly digital-first providers like Arden University, where there is a need to ensure that curricula are coherent, relevant, and dynamically aligned in an era of profound technological and societal disruption. It confronted the risk of curricula becoming static, misaligned collections of credits rather than intentionally designed learning journeys. To address this, this study developed, applied, and evaluated a comprehensive curriculum mapping framework as a strategic tool for continuous, evidence-based improvement. The central argument of this paper is that a systematic, collaborative, and theoretically grounded approach to curriculum mapping is not merely a quality assurance exercise, but an essential practice for any institution committed to delivering on its promise of a high-quality, future-ready education.

The application of this framework to the case study of Arden University's BA (Hons) Business Management programme yielded several critical findings that underscore the utility of the process. Firstly, the analysis of the Programme Learning Outcomes (PLOs) revealed a significant gap between the programme's stated goals and the skills identified as critical by external benchmarks such as the QAA (2023) and the World Economic Forum (2023),

particularly regarding AI literacy, advanced data analytics, and sustainability. This highlights the tendency for PLOs to lag behind the rapid pace of industry change and reinforces the necessity of regular, benchmark-driven review. Secondly, the diagnostic analysis of the programme's structure identified a crucial tension between strong *vertical coherence*, where concepts are effectively scaffolded within subject silos, and a weaker *horizontal coherence*, where the integration of transferable skills across different modules is not systematic. This finding gives credence to the literature that warns against curricula functioning as a collection of discrete topics rather than an integrated whole (Harden, 2001; Kopera-Frye et al., 2008). Finally, the analysis of AI integration revealed that its treatment as an isolated topic, rather than an infused, cross-curricular competency, fails to prepare students for a workplace where AI is a ubiquitous tool. These findings collectively demonstrate that even a well-intentioned, contemporary curriculum can suffer from structural weaknesses that are only made visible through a holistic mapping process.

Implications of the Study

The findings and the framework itself carry significant implications for curriculum governance, pedagogical practice, and institutional strategy within higher education.

For **curriculum governance and leadership**, this study demonstrates that curriculum mapping, when properly implemented, is a powerful tool for academic leadership. It provides a structured and evidence-based mechanism for fostering the "collaborative dialogue" and "community of practice" that the literature identifies as essential for overcoming faculty resistance and achieving meaningful, sustainable change (Joyner, 2016b; Archambault & Masunaga, 2015). It moves curriculum review from a potentially contentious, opinion-based debate to a data-informed, professional conversation focused on the collective student experience. For an institution like Arden, with its geographically dispersed faculty, the map becomes an essential shared artefact that builds a sense of team ownership and overcomes the "smoke-stack syndrome" that can plague academic departments (Saad, 2014).

For **pedagogical practice**, the implications are profound, particularly concerning assessment in the age of AI. The study's recommendations for "AI-aware" assessments push faculty and institutions to move beyond a defensive posture of trying to prevent academic misconduct towards a proactive stance of redesigning assessments to measure the higher-order skills of critical evaluation, ethical judgment, and metacognition. This requires a fundamental shift in how learning is measured, directly aligning with the principles of constructive alignment (Biggs, 2003; Livingstone, 2014) by ensuring that if we intend for students to learn to work *with* AI, our assessments must be designed to measure their ability to do so effectively and ethically.

For **institutional strategy**, this research shows that adopting a systematic mapping process is not just an operational tactic but a strategic act. For a university like Arden, it provides tangible evidence to support its brand identity as "progressive" and "innovative." It allows the institution to demonstrate to students, employers, and accreditation bodies like the QAA and foreign bodies such as the AACSB that its curriculum is intentionally designed and dynamically managed to produce genuinely work-ready graduates. In a competitive market, such demonstrable coherence and relevance is a powerful differentiator.

Limitations of the Study

As a scholarly work, it is important to acknowledge the limitations of this study. The primary limitation is its conceptual and documentary nature. The application of the

framework was a conceptual analysis based on publicly available documents representing the "written" or "intended" curriculum. It cannot, therefore, make definitive claims about the "enacted" curriculum (what actually happens in the virtual classroom) or the "learned" curriculum (what students actually take away from their experience) (Kopera-Frye et al., 2008; Arafeh, 2016). A full empirical study would require triangulation with other data sources, such as classroom observations, student focus groups, and analysis of student work.

Secondly, as a **single-case study**, the specific findings related to the Arden University programme are not statistically generalisable to other institutions. The purpose of a case study, however, is not statistical generalisation but "analytical generalisation," where the goal is to expand and generalise theories (Yin, 2018). While the specific diagnosis is unique to Arden, the framework, the methodological process, and the types of issues identified (e.g., the tension between vertical and horizontal coherence) are designed to be highly transferable to other higher education institutions, particularly those operating in a digital-first environment.

Future Directions for Research and Practice

The findings and limitations of this paper point toward several critical directions for future research and practice in the field of curriculum mapping and design.

The most immediate next step is the **empirical validation** of the proposed framework. Future research should apply this framework in a real-world setting, such as Arden University, and conduct a longitudinal study to measure the impact of the resulting curriculum changes. Such a study could use pre- and post-intervention data to measure shifts in student performance, engagement, retention rates, and perceptions of their learning journey (Bull, 2025; Joyner, 2016b). This would provide the empirical evidence needed to move the framework from a theoretical model to a proven tool for enhancement.

A second, exciting avenue for future research lies in **"smart" curriculum mapping**. As discussed by Alam and Benaida (2022), the integration of AI into the mapping process itself holds significant potential. Future studies could investigate the development and efficacy of AI-powered tools that could automate parts of the data collection and analysis, provide real-time data visualisations of curriculum coherence, and even use predictive analytics to model the potential impact of proposed curriculum changes.

Thirdly, future research could conduct **cross-disciplinary and cross-institutional studies**. Applying this framework to different disciplines within the same institution would provide valuable insights into the variations in mapping approaches and purposes, as noted by Rawle et al. (2017). Furthermore, comparative case studies between different types of institutions (e.g., digital-first vs. traditional campus-based) would help to understand how institutional context shapes the challenges and successes of curriculum mapping initiatives.

Finally, future practice should explore the role of **student co-creation** within the curriculum mapping process. The current model positions students primarily as a source of feedback data. A more radical, student-centred approach would involve students as active partners in the mapping and design process, giving them a voice in shaping their own educational journey. Research into the methodologies and impact of such a co-creative approach would be a valuable contribution to the literature on student-centred learning (Livingstone, 2014).

In conclusion, this paper has sought to contribute by synthesising a comprehensive, theoretically grounded, and practical framework for curriculum mapping in the digital age. In a world of constant disruption, a curriculum that is intentionally designed, transparently structured, and dynamically reviewed is arguably the most powerful tool a university has to prepare its students for a future that is complex and uncertain.

Declarations

Conflict of Interest

The author also declares no conflicts of interest in the preparation or publication of this manuscript.

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