



FLEX-COMP: A Conceptual Framework for Competency-Based Learning and Assessment Governance in Higher Education

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Abstract

Higher education faces growing pressure to offer flexible learning while demonstrating graduate outcomes. However, institutions often develop competency-based education, flexible pathways, blended learning, assessment, learning analytics, and governance as separate initiatives, weakening coherence across curriculum, progression, and quality processes. This conceptual paper develops the FLEX-COMP framework through literature-based conceptual synthesis. FLEX-COMP positions program and course competencies as its organizing core. It proposes modular and stackable learning units that allow variation in pace, place, and sequence while maintaining shared competency expectations. A blended learning ecology supports these pathways, combining face-to-face, synchronous online, and asynchronous learning activities, informed by the Community of Inquiry perspective. Progression is proposed to depend on demonstrated mastery rather than time spent, with projects, simulations, reflective artifacts, and e-portfolios generating evidence of learning. The framework further proposes links between assessment evidence, learning analytics, and governance. With appropriate institutional governance and interpretation, analytics dashboards may support monitoring competency and learner progression across pathways and inform curriculum review, learner support, and institutional decision-making. The framework also identifies the need for governed approaches to distinguish AI-assisted performance from independent demonstrations of competencies; empirical examination is needed to assess the validity, ethics, and feasibility of both. Conceptualized as a concentric model, FLEX-COMP connects competencies, pathways, curriculum design, blended learning, assessment, analytics, and governance. It offers design propositions for institutions considering flexible, competency-driven learning, but its implementation, effectiveness, equity, and applicability across disciplines and contexts remain empirically untested.

Keywords: *Competency-Based Education, Flexible Learning Pathways, Blended Learning, Learning Analytics, Academic Integrity, Artificial Intelligence in Education*

INTRODUCTION

Higher education increasingly faces two demands often treated as competing priorities: expanding flexibility in how learners access and progress in their studies and strengthening the transparency and accountability of learning outcomes. Institutions face pressure to accommodate diverse student profiles, support lifelong learning, and leverage digital delivery modes while ensuring coherence, comparability, and quality assurance across programs.

In response, several influential approaches have gained prominence. Competency-Based Education (CBE) reframes progression around demonstrated mastery rather than time-based completion, emphasizing clearly articulated learning outcomes and performance-based assessment (Levine & Patrick, 2019; Williams, 2025).

Blended learning expands the pedagogical design space by integrating face-to-face, synchronous, and asynchronous modalities to support interaction, engagement, and higher-order learning (Garrison & Kanuka, 2004; Graham, 2006). At the same time, flexible learning pathways have emerged as a structural response to changing learner needs, enabling variation in pace, place, and sequence, often linked to modularization, stackable credentials, and recognition of prior learning (Wang, 2023; Li et al., 2024).

Learning analytics further contributes by enabling data-informed monitoring of learner



progression and supporting continuous improvement at both course and institutional levels (Ferguson, 2012; Siemens, 2013). Combining competency-based education with blended learning has been recognized as particularly powerful for personalizing progression while maintaining outcome integrity (Patrick & Sturgis, 2015).

Despite their individual strengths, institutions may develop or implement these approaches through separate processes, making alignment across curriculum, progression, assessment, data use, and governance more difficult (Bozkurt et al., 2020; Ifenthaler & Yau, 2020; Williams, 2025). Such separation may limit coherent institutional alignment across curriculum, progression, assessment, data use, and governance. As a result, institutions may expand flexibility without sufficiently integrating it into quality assurance systems. At the same time, outcome-based models may lack the institutional mechanisms needed to operate effectively at scale.

This paper responds to this challenge by proposing the FLEX-COMP Framework, an integrated model that aligns competency-based progression, flexible pathways, blended learning design, and analytics-informed governance within a unified institutional architecture. Rather than introducing entirely new concepts, the framework synthesizes and extends existing approaches into a coherent design logic that supports both flexibility and accountability in higher education.

This conceptual paper has three objectives: (1) to synthesize literature on competency-based education, flexible learning pathways, blended learning, mastery-oriented assessment, learning analytics, and AI-related assessment governance; (2) to develop a theoretically informed framework that specifies relationships among these elements; and (3) to identify design propositions and institutional conditions for future empirical evaluation of the framework.

Research questions:

1. How can competency-based education, flexible pathways, blended learning, assessment, analytics, and governance be conceptually aligned within one institutional framework?
2. What design principles can support the verification of competency in settings where AI-assisted work is possible?
3. What implementation conditions and questions require empirical testing before FLEX-COMP can be adopted or evaluated?

LITERATURE REVIEW

Flexibility, Coherence, and Pathway Equivalence

Higher education increasingly seeks to accommodate learners who differ in prior experience, work commitments, location, and preferred pace of study. Flexible learning pathways respond to this diversity by allowing variation in when, where, and in what sequence learning occurs.

Modular curriculum structures, stackable learning units, micro-credentials, recognition of prior learning, and alternative entry or exit points can enable such pathways (Wang, 2023; Martin & Furiv, 2024). These arrangements can widen participation and support lifelong learning. However, they also create a central design challenge: how can institutions offer meaningful variation in learner routes without weakening the coherence or comparability of graduate outcomes?

This challenge is not solved by modularization alone. When modules are developed independently, or pathways expand without common outcome requirements, learners may face fragmented experiences and uneven opportunities to demonstrate key capabilities.

Boud and Jorre de St Jorre (2021) argue that expanding micro-credentials exposes limitations in conventional credential structures, particularly when the link between short learning units and broader educational outcomes is unclear. Similarly, flexible pathways require institutions to define which competencies remain common across routes, how they ensure equivalent learning

opportunities, and what evidence will be accepted as demonstrating achievement.

For FLEX-COMP, flexibility is therefore treated as a design issue rather than simply a delivery feature. The framework proposes that pace, place, and sequence may vary, while competencies, assessment expectations, and quality processes remain sufficiently visible across pathways. This proposition requires empirical investigation because we cannot assume equivalence in learning experiences and outcomes across diverse routes.

Mastery, Assessment Evidence, and AI-assisted Performance

Competency-based education shifts attention from time spent in instruction to evidence that learners can demonstrate specified knowledge, skills, and professional capabilities. Clear competencies can strengthen alignment among curriculum, learning activities, and assessment, especially when institutions seek transparent evidence of graduate attributes (Levine & Patrick, 2019; Mulder, 2014). Constructive alignment also provides a useful foundation for linking intended outcomes to teaching activities and assessment tasks, but it should not reduce complex learning to a checklist of isolated competencies (Stamov Roßnagel et al., 2021; Newby & Cornelissen, 2025).

The assessment challenge is particularly significant in flexible and technology-rich settings. Projects, simulations, workplace tasks, e-portfolios, and reflective artifacts can generate evidence of applied learning. However, authentic formats alone do not automatically establish that submitted work represents independent student capability.

Generative AI can legitimately support brainstorming, feedback, language refinement, and revision, but it may also complicate interpretation of what a learner can do without technological assistance. Studies discussed in the existing literature illustrate both potential educational benefits and concerns about overreliance, independent skill development, academic integrity, and authentic authorship (Budiyo et al., 2025; Corbita et al., 2025; Espartinez, 2025).

Emerging classroom-based evidence suggests that AI-assisted feedback should be governed rather than simply permitted or prohibited. An action research study of AI-supported teacher feedback in an EFL writing course found that generative AI meaningfully reduced a teaching assistant's evaluation workload, but required iterative human correction to address inconsistencies, and fully independent, individualized AI feedback remained an unresolved goal even after two refinement cycles (Yu & Zhang, 2026).

This is consistent with FLEX-COMP's proposition that AI-supported and AI-free evidence streams should be treated as complementary layers within an assessment architecture, with human judgment retained as a necessary governance function rather than an optional safeguard.

This creates a tension between assessment authenticity and evidentiary validity. FLEX-COMP does not assume that AI-free tasks or authentic assessment alone resolve this challenge. Instead, it proposes that institutions consider an assessment architecture that makes AI-use expectations transparent and incorporates appropriately designed opportunities for independent demonstration of selected competencies. Empirical evaluation is still needed to assess the validity, accessibility, fairness, and educational effects of such approaches.

Blended Learning as Intentional Design

Blended learning involves more than combining physical and online teaching spaces. Its educational value depends on how learning activities are distributed across modes and how those activities support engagement, interaction, reflection, feedback, and applied practice. Graham (2006) and Garrison and Kanuka (2004) describe blended learning as the purposeful integration of face-to-face and online learning rather than a simple technological mixture.

Research also indicates that blended environments can support higher-order learning when they focus on meaningful activity and interaction rather than merely delivering content (Boelens et

al., 2017; Hague, 2024).

This design logic is echoed in recent framework-building work outside this paper's immediate literature base. The Authentic-Digital Nexus (ADN) Framework, for instance, similarly integrates authentic, problem-based learning with flexible, technology-enhanced delivery in higher education STEM contexts (Kovács, 2026). The emergence of comparable architectures suggests that the integration FLEX-COMP proposes reflects a broader disciplinary movement rather than an isolated proposition.

The Community of Inquiry framework offers a useful lens for explaining this design challenge. Cognitive presence concerns learners' engagement with ideas and inquiry; social presence concerns purposeful interaction and community; and teaching presence concerns the design, facilitation, and direction of learning (Garrison et al., 1999).

Within FLEX-COMP, these concepts inform the proposed learning ecology. Face-to-face activities may be appropriate for practice, coaching, collaborative application, and assessment dialogue. Synchronous online sessions may support clarification, peer interaction, and timely feedback. Asynchronous learning may create space for preparation, reflection, independent study, and participation across differing schedules.

The key argument is not that every competency should be taught in every mode. Rather, modality choices should follow the nature of the competency, the learning activity, learner circumstances, and the type of evidence required. This positions blended learning as a deliberately designed layer within the wider framework, not as an isolated delivery solution.

Analytics, Governance, and Responsible Interpretation

Learning analytics can provide information about learner engagement, progression, and evidence of competency in flexible learning settings. Earlier scholarship highlights its potential to support learner success and institutional decision-making, while more recent work also emphasizes the need for careful interpretation, ethical practice, and clear governance arrangements (Ferguson, 2012; Siemens, 2013; Ifenthaler & Yau, 2020). Analytics may be particularly useful where students follow different pathways because institutional leaders need visibility of progression patterns, bottlenecks, and differences in achievement evidence across routes.

However, analytics should not be treated as a neutral or complete representation of learning. Learning data may simplify complex educational processes, and analytics systems can create risks related to privacy, surveillance, bias, and inappropriate decision-making if their purpose, data sources, and use are not carefully governed (Tsai et al., 2018). Consequently, staff should interpret dashboard information alongside assessment evidence, staff judgment, learner context, and institutional policy, rather than using it as a standalone measure of learning quality or student capability.

Within FLEX-COMP, analytics are positioned as part of a governance feedback loop. The framework proposes that information on competency evidence and learner progression may contribute to curriculum review, learner support, pathway design, and quality assurance processes. It does not claim that analytics can directly detect AI dependency, academic misconduct, or authentic competence. Instead, differences between AI-assisted and independently produced assessment evidence may be explored cautiously within transparent institutional policies. The validity, fairness, privacy implications, and practical value of any such indicators require empirical testing.

Integrated Conceptual Gap

The reviewed literature provides valuable but often separate explanations of flexible

pathways, competency development, blended learning, assessment, and analytics. Flexible-pathway scholarship addresses learner access and structural adaptability; competency-based education focuses on clearly specified outcomes and mastery; blended-learning research explains the purposeful combination of learning modes; and learning-analytics literature examines data-informed support and institutional decision-making. However, there remains limited conceptual guidance on how these elements can be coordinated as parts of a single institutional architecture.

The gap is therefore not a lack of individual models. Rather, it concerns the relationships among the models: how common competencies can guide diverse pathways; how blended activities can support the development of those competencies; how assessment can produce meaningful evidence across varied routes; and how institutions may interpret that evidence responsibly through governance processes. FLEX-COMP responds by proposing a concentric framework that connects these dimensions while treating its relationships and implementation effects as propositions requiring future empirical evaluation.

Table 1. Literature-Derived Design Tensions, FLEX-COMP Responses, and Questions for Empirical Evaluation

Debate	Limitations in Existing Literature	FLEX-COMP Response	Unresolved Empirical Question
Flexible pathways	Pathways may compromise coherence or equivalence	Common competency and evidence requirements across routes	Do alternative pathways achieve comparable outcomes?
Mastery and AI	Submitted work may not represent independent capability	Planned AI-assisted and AI-free evidence points	Which verification designs are valid and equitable?
Blended design	Mode combinations can be technologically driven rather than pedagogically designed	CoI-guided allocation of activities across modes	Which ecology works best for which competencies?
Analytics and governance	Analytics may reduce complex learning to indicators	Governance review of indicators alongside qualitative evidence	Which indicators are valid, ethical, and actionable?

The table summarizes the conceptual tensions identified across the reviewed literature, the corresponding propositions within FLEX-COMP, and questions requiring empirical investigation.

RESEARCH METHOD

Conceptual Synthesis and Framework Development

This study used a literature-based conceptual synthesis to develop the FLEX-COMP framework. The approach treated the framework as a network of related concepts derived and integrated from multidisciplinary literature, rather than as an empirically tested intervention (Jabareen, 2009).

Consistent with the distinction between literature reviews, theoretical frameworks, and conceptual frameworks, the study uses prior scholarship to articulate relationships among relevant educational concepts and to propose a coherent institutional architecture (Rocco & Plakhotnik, 2009).

The synthesis focused on six interrelated areas: competency-based education, flexible learning pathways, competency-based curriculum design, blended learning, mastery-based

assessment, and learning analytics with institutional governance. The synthesis also considered literature on artificial intelligence in education, academic integrity, and independent competency demonstration because generative AI raises questions about interpreting assessment evidence in flexible learning environments.

Sources included foundational theoretical work, peer-reviewed research, relevant policy and sector publications, and recent studies addressing higher-education practice. Materials were selected for their relevance to one or more elements of the proposed framework and for their ability to clarify relationships among curriculum design, learner progression, assessment, data use, and governance.

The conceptual analysis proceeded in three stages. First, recurring challenges, principles, and design concepts were identified within each literature area. Second, these concepts were compared to determine their institutional function, including the learning problem addressed, the evidence or inputs required, the decisions they support, and their relationship to other components. Third, the concepts were integrated into a six-layer model. The framework places program and course competencies at the center because they define the intended outcomes to which pathways, curriculum, learning activities, assessment, analytics, and governance should align.

The framework draws particularly on constructive alignment to explain the relationship between intended learning outcomes, learning activities, and assessment evidence. The Community of Inquiry perspective informs the blended learning ecology by guiding the purposeful use of face-to-face, synchronous online, and asynchronous learning activities to support teaching, social, and cognitive presence. Learning-analytics scholarship and institutional governance literature inform the outer feedback processes through which assessment information may be interpreted for learner support, curriculum review, and institutional decision-making.

The concentric representation is intended to show dependency rather than hierarchy. Inner layers establish the educational purpose and learning design, whereas outer layers generate, interpret, and govern evidence arising from those processes. The relationships proposed in the model are conceptual and should not be interpreted as evidence of effectiveness, validity, or applicability across settings.

The framework development did not include formal expert validation, pilot implementation, or empirical testing. Accordingly, FLEX-COMP should be understood as an initial conceptual proposition. Its feasibility, clarity, equity implications, implementation requirements, and educational effects require examination through future expert review, case application, and empirical research.

The six components were retained because each addressed a distinct institutional function identified repeatedly in the literature: defining outcomes, enabling route flexibility, organizing learning design, generating assessment evidence, interpreting progression information, and governing institutional response. Components were arranged concentrically where their function depended on, or generated evidence from, the preceding layer. This selection and ordering represent an interpretive conceptual synthesis rather than a validated causal model.

FINDINGS AND DISCUSSION

The FLEX-COMP Framework

The FLEX-COMP Framework is an outcomes-centered model for designing and governing flexible, competency-driven blended learning in higher education. It is built around six interrelated elements: student outcomes and competencies, flexible pathways, competency-based curriculum design, blended learning ecology, mastery-based assessment, and learning analytics with governance feedback loops. The framework is based on the proposition that flexibility and quality need not be treated as opposing goals when progression, evidence, and institutional oversight are

intentionally aligned.

To illustrate how the framework may be operationalized, institutions could begin by: (1) mapping program-level competencies to modular curriculum units and aligned assessment evidence; (2) designing blended learning activities that distribute cognitive, social, and teaching presence across delivery modes; and (3) considering analytics dashboards that may support the monitoring of competency attainment and learner progression. Subject to institutional governance, data-quality safeguards, and contextual interpretation, the resulting information may inform curriculum review and institutional decision-making.

Core: Student Outcomes and Competencies

At the center of the framework are program-level and course-level competencies aligned with graduate attributes and, where relevant, professional or disciplinary expectations. These competencies define what students should know, be able to do, and demonstrate by the end of a learning sequence. They also provide a consistent basis for mapping curriculum, assessment, and analytics across different pathways.

Flexible Learning Pathways

The next layer of the framework is flexibility in pace, place, and sequence. Pace refers to the speed at which students move through modules or stages. Place refers to where participation occurs, such as campus, home, workplace, or hybrid settings. Sequence refers to the order in which learners complete the modules, including branching, stacking, or alternative entry and exit points ([Martin & Furiv, 2024](#)). These variations allow institutions to respond to student diversity without abandoning shared outcomes.

Competency-Based Curriculum Design

To support flexible pathways, the curriculum is organized into modular and coherent units that can stand alone or combine into larger program structures. Each module is mapped to explicit competencies, learning activities, and evidence requirements. This structure may let students progress through different routes while keeping clear what must be mastered and how mastery will be judged ([Mulder, 2014](#)).

Blended Learning Ecology

The framework treats blended learning as an ecology rather than as a simple mix of delivery channels. Face-to-face activities may be used for collaboration, practice, coaching, and applied discussion. Synchronous online sessions may support real-time interaction, clarification, and peer engagement. Asynchronous online activities may support reflection, preparation, independent study, and flexible participation. The key point is that these modes are intentionally combined to support cognitive, social, and teaching presence across the learner journey ([Garrison et al., 1999](#); [Graham, 2006](#)).

Mastery-Based Assessment

Progression in FLEX-COMP is based on demonstrated mastery rather than the amount of time spent in a class or on a platform. Assessments are therefore designed as evidence-generating activities directly aligned to competencies. Suitable forms include performance tasks, authentic projects, simulations, reflective artifacts, and e-portfolios. This approach is intended to generate evidence relevant to whether students can apply knowledge and skills in meaningful contexts.

An emerging challenge in contemporary mastery-based assessment is distinguishing AI-assisted performance from genuinely independent competency. Students may submit work that

meets all apparent proficiency criteria while relying heavily on AI writing tools for ideation, structure, and linguistic refinement (Budiyo et al., 2025).

This creates a problematic gap between assessed performance and actual capability—one that may only become visible when students face contexts requiring unassisted application of skills they appear to have mastered. For FLEX-COMP implementations, this suggests that authentic assessment design must strategically incorporate periodic AI-free performance tasks. These unassisted demonstrations may provide one source of evidence for verifying selected competencies, subject to appropriate assessment design, accessibility considerations, and empirical evaluation.

Rather than assuming that AI tools should be either wholly prohibited or unrestricted, FLEX-COMP proposes an assessment design approach that may combine AI-supported learning activities with clearly specified opportunities to demonstrate selected competencies independently. Empirical evaluation is needed to assess this approach's appropriateness, feasibility, and effects.

Learning Analytics and Governance Feedback Loops

FLEX-COMP proposes that institutions may explore carefully governed indicators of differences between AI-assisted and independently produced work. Such indicators should not be treated as direct measures of dependency or academic misconduct. Institutions should empirically evaluate their validity, fairness, privacy implications, and pedagogical usefulness, and govern them transparently.

Assessment evidence may feed into analytics processes that support the examination of student progression at individual and cohort levels. With appropriate institutional governance, dashboards may help educators identify patterns in competency attainment and progression, as well as potential bottlenecks across pathways or delivery modes.

For example, a dashboard could present competency-attainment rates across cohorts, indicate modules where learners struggle, and compare progression patterns across alternative pathways. When interpreted alongside professional judgment and contextual evidence, such information may inform curriculum review, learner support, and institutional decision-making. In FLEX-COMP, analytics serve as a proposed feedback mechanism that links assessment evidence to course redesign, program review, resource planning, and policy development.

Diagrammatic Representation

The framework can be visualized as a concentric model. At the center sit students' outcomes and competencies. Around this core are flexible learning pathways, represented through pace, place, and sequence. A wider surrounding layer combines competency-based curriculum design with a blended learning ecology of face-to-face, synchronous online, and asynchronous online modes.

Outside this sit mastery-based assessment and learning analytics, which gather and interpret evidence of progression. The outer perimeter represents institutional governance and quality assurance, which receive data from inner layers and feed decisions back into curriculum, pathway design, and support systems.

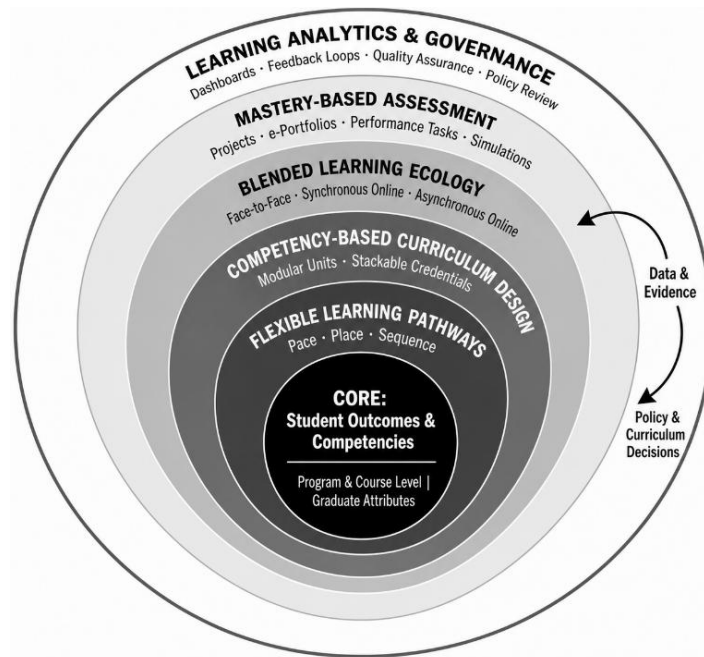


Figure 1. FLEX-COMP: An Integrated Framework for Flexible, Competency-Based Blended Learning.

Note. Author's own conceptual representation.

Rationale for the Concentric Structure

The concentric arrangement of FLEX-COMP represents a sequence of educational dependency rather than a ranking of importance. The framework begins with program- and course-level competencies because these specify the knowledge, skills, and capabilities that learners are expected to demonstrate. All subsequent design decisions are intended to remain connected to these shared competency expectations.

The second layer, flexible learning pathways, describes the alternative routes through which learners may work toward the same competencies. Flexibility may occur in pace, place, and sequence, but the intended competencies provide a common reference point across these variations. This relationship is central to the framework: pathways may differ, whereas the expectations for demonstrated learning remain visible and comparable.

The third layer combines competency-based curriculum design and the blended learning ecology. These are presented as paired elements within one design layer, rather than as separate layers. Curriculum design organizes competencies into modular learning units, specifies learning activities, and identifies the evidence expected from learners. The blended learning ecology determines how those activities are distributed across face-to-face, synchronous online, and asynchronous environments. Together, they create learning opportunities through which learners may develop the intended competencies across different pathways.

The fourth layer, mastery-based assessment, focuses on collecting evidence. It connects the competencies defined at the center with the learning experiences created through the curriculum and learning ecology. Projects, simulations, reflective artifacts, e-portfolios, and other appropriately designed tasks may provide evidence relevant to learners' achievement of particular competencies.

Where AI-supported learning is permitted, assessment design may also include transparently specified opportunities for independent demonstration of selected competencies. Such approaches are conceptual propositions and require empirical evaluation. Emerging evidence from technology-mediated learning environments supports this evidentiary logic.

In a numeracy intervention using a controlled e-game format, sustained hands-on engagement with the technology was associated with measurable gains in mastery, with time spent using the application positively correlated with post-intervention performance (De La Torre et al., 2026). While this evidence comes from a different educational level and skill domain, it illustrates a broader pattern relevant to FLEX-COMP: technology-supported practice can generate defensible evidence of mastery when paired with structured pre- and post-assessment.

The fifth layer, learning analytics, concerns organizing and interpreting information generated through learner progression and assessment evidence. With appropriate governance, analytics can help institutions examine patterns of competency attainment, progression, and potential bottlenecks across pathways. Analytics are not treated as direct measures of learning quality, academic misconduct, or AI dependency; their use requires careful interpretation alongside professional judgment and contextual information.

The outer layer, institutional governance and quality assurance, links the framework to organizational decision-making. Governance processes may use appropriately interpreted evidence to inform curriculum review, learner-support arrangements, pathway design, staff development, resource planning, and relevant policy decisions. This outer position reflects governance's role in connecting evidence generated across the framework with institutional oversight and continuous improvement.

Taken together, the structure moves from intended competency to learner route, to learning design, to assessment evidence, to information interpretation, and finally to institutional response. The layers are connected through feedback rather than a one-way sequence: governance decisions may lead to changes in assessment, learning design, pathways, or competency mapping. The concentric model therefore represents an integrated architecture whose relationships and practical effects remain to be tested across higher-education contexts.

Table 2. Illustrative Mapping of Program Competencies to Modular Learning Activities, Assessment Evidence, and Analytics Considerations in FLEX-COMP

Program Competency	Modular Unit	Blended Learning Activity	Assessment Task	AI-Use Condition	Evidence of Mastery	Analytics Indicator
Evidence-based business decision-making	Business analytics module	Asynchronous data tutorial; synchronous case workshop; face-to-face simulation	Individual case analysis and oral defense	AI may support brainstorming; final analysis and defense completed under declared conditions	Rubric, annotated dataset, recorded defense, reflection	Competency attainment; resubmission pattern; pathway progression
Professional communication	Applied communication module	Peer review workshop; online drafting; coaching session	Portfolio and timed independent writing task	AI-supported draft permitted; AI-free verification task required	Draft history, feedback response, timed task, reflective commentary	Portfolio completion; independent task score; feedback uptake

The table provides a conceptual illustration of how competency expectations may be linked to modular units, blended learning activities, assessment tasks, evidence requirements, and potential analytics considerations. It does not represent an implemented or validated design.

Discussion and Implications

Business and management schools may be suitable contexts in which to examine the FLEX-COMP framework because they often serve diverse student groups, including full-time, part-time, executive, and lifelong learners. Their applied learning aims, such as problem-solving, communication, teamwork, leadership, and decision-making, may provide relevant contexts for examining competency mapping, flexible pathways, blended learning activities, and assessment evidence. Any implementation would require contextual adaptation, appropriate institutional governance, and empirical evaluation ([Graham, 2006](#); [Ragg & Piers, 2017](#)).

This proposition is worth situating against the broader evidence base on competency-based education. A recent systematic review of 73 studies on CBE implementation found that while adult-learner retention, workforce alignment, and recognition of prior learning are consistently reported as benefits, the underlying evidence remains methodologically constrained — relying heavily on institutional self-report data with limited use of matched comparison groups — and that equity implications are structurally plausible but empirically unconfirmed ([Zaky, 2026](#)).

This pattern reinforces two aspects of FLEX-COMP's positioning: first, that treating the model as a conceptual proposition rather than a validated intervention is consistent with the current state of CBE evidence generally, not a limitation unique to this paper; and second, that future empirical testing of FLEX-COMP should prioritize matched-comparison designs and disaggregated equity analysis — gaps that persist across the wider CBE literature.

FLEX-COMP's originality lies in integrating established strands into one model rather than claiming each element is entirely new. Competency-based education, blended learning, flexible pathways, and learning analytics all have established literature and practical traditions ([Mulder, 2014](#)). What FLEX-COMP adds is a unified architecture that connects these strands through explicit competency mapping, modular pathway design, mastery-based evidence, and institution-level feedback loops.

This suggests potential conceptual and practical value, subject to empirical examination. Conceptually, it offers a clear way to understand how flexibility, blended delivery, competency progression, and quality processes relate to one another ([Ragg & Piers, 2017](#)). Practically, it proposes a design logic that institutions may adapt for program development, review, and governance. In this sense, FLEX-COMP can be positioned as a synthesis and extension framework for contemporary higher education rather than as a standalone theory detached from prior scholarship.

Institutional context, including digital infrastructure, staff capability, assessment policy, learner access, language, disciplinary requirements, and data-governance arrangements, is likely to shape the application of FLEX-COMP. The framework should therefore not be treated as a universal prescription. Its design propositions require contextual adaptation and empirical examination across different higher-education settings, institutional types, and learner populations.

CONCLUSIONS

This paper set out to answer three questions: how competency-based education, flexible pathways, blended learning, assessment, analytics, and governance might be brought into a single institutional logic; what design principles could help distinguish independent competency from AI-assisted performance; and what would need to be tested before FLEX-COMP could move from proposal to practice.

The synthesis developed here answers the first question directly — the concentric structure gives these six elements a shared reference point in program-level competencies, rather than leaving them to develop in parallel. The second question is addressed only in outline: the framework argues for deliberately placed AI-free verification points within an otherwise AI-supported assessment design, but whether that approach is fair, practical, or even necessary across disciplines is not something a literature synthesis can settle. The third question is, by design, left open — answering it is the paper's stated purpose for future work, not something it claims to resolve here.

Framed honestly, FLEX-COMP's strongest contribution is architectural: it gives institutions a way to see how competency definition, pathway design, and governance depend on one another, which is something the fragmented literature on these topics does not currently offer. Its weakest points are exactly where the paper is most speculative — the assessment-integrity mechanisms and the analytics indicators are plausible on paper but rest on no expert review, pilot data, or field testing. Readers should treat those components as hypotheses the framework makes testable, not as solutions it has already validated.

For curriculum designers, the practical takeaway is a way of mapping competencies to modular units and evidence requirements that survives variation in pace, place, and sequence. For quality assurance units and institutional leaders, it offers a governance loop connecting assessment evidence back to curriculum and policy decisions — if the loop is built with local infrastructure, staff capacity, and data governance in mind, not imported wholesale. None of this replaces the empirical work still to be done. What this paper offers is a structure worth testing, not a result to be adopted.

LIMITATION & FURTHER RESEARCH

This paper is conceptual and therefore has limitations. The framework has not yet been tested through comparative implementation across multiple institutions, disciplines, or student populations. As a result, its effectiveness in improving learning outcomes, student experience, staff workload, or institutional responsiveness remains empirically unestablished.

Future research could apply the framework in pilot programs and examine how it shapes curriculum design, assessment quality, learner progression, and governance processes over time. Comparative case studies could also explore whether the model needs to be tested differently in undergraduate, postgraduate, and executive education settings, or in disciplines with different accreditation pressures.

A further line of inquiry concerns learning analytics: future work should test how dashboards can best represent competency attainment across multiple learner pathways without oversimplifying student learning, and should also develop and pilot an actual working prototype—evaluated with real or simulated institutional data under appropriate governance and ethical oversight—rather than the schematic illustration offered in this conceptual paper.

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