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A rose by any other name: AI augmented HyFlex learning

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Abstract

This paper addresses a dual challenge in higher education: making HyFlex implementation more sustainable whilst overcoming terminology-based resistance that prevents educators from recognising intelligent tools as pedagogical supports. Between October 2024 and July 2025, the University of Southern Queensland participated as the sole non-European institution among 17 providers in the Jisc Beyond Blended pilot, simultaneously running an internal HyFlex-Beyond Blended initiative across two trimesters.

Drawing on a Scholarship of Teaching and Learning framework and critical reflective practice, this study examines the integration of intelligent tools across synchronous and asynchronous HyFlex modalities. Insights from practice suggest that framing tools by pedagogical function rather than technological label reduced adoption resistance and supported HyFlex principles of choice, flat learning, and accessibility. Purpose-built AI agents supported learning design, automated content creation reduced educator workload, and conversational AI enhanced asynchronous engagement. However, infrastructure limitations, a flexibility-engagement paradox, and a lack of student feedback constrain claims.

Three theoretical contributions are offered: framing affects intelligent tool adoption; AI capabilities can operationalise HyFlex principles that have been theoretically sound but practically challenging; and critical reflective practice can generate valid scholarly insights from institutional pilots. Implications include pedagogical framing in change management, phased implementation, and embedding tools within existing workflows.

Introduction

When Shakespeare's Juliet in 1597 declared, "What's in a name? That which we call a rose by any other name would smell as sweet," the world of educational technology (edtech) and Artificial Intelligence (AI) was merely a future dream. Yet this metaphor perfectly captures a contemporary challenge in higher education (HE): the "AI" label often triggers resistance that prevents educators from recognising how intelligent educational tools might address longstanding pedagogical challenges. As Warr and Heath (2025) argue, the "AI" label can act as a "trojan horse" for a hidden curriculum that reinforces traditional power structures, effectively masking the tool's potential to foster student agency. Consequently, the terminological anxiety overshadows the actual educational affordances these tools offer.

This paper adopts Juliet's wisdom to look beyond technological labels and examine educational effectiveness. As a regional Australian university with over 21,000 students, 89% domestic and 70% from equity groups, the University of Southern Queensland (UniSQ) brings to this project its long-standing leadership in online and blended learning and its mission to serve a diverse, geographically dispersed population. Whether using the term AI chatbots, intelligent tutoring systems or tools, or adaptive learning platforms, what counts is their capacity to enhance learning design and student outcomes. The "rose" in the contemporary educational garden is personalised and accessible education and that sweetness remains regardless of the technological terminology.

This study addresses a critical tension in contemporary higher education: HyFlex learning has emerged as a theoretically grounded and empirically supported university-wide design approach. Rooted in Beatty's (2006) foundational framework of four core principles: Learner Choice, Equivalence, Reusability, and Accessibility, HyFlex offers students the agency to select their mode of participation across in-person, synchronous online, and asynchronous pathways, without penalty or disadvantage. A decade of accumulated scholarship confirms that this model has matured well beyond its pandemic-era origins into a deliberate institutional strategy for equitable access and instructional continuity (Beatty, 2026; Romero-Hall et al., 2026). Empirical evidence from undergraduate contexts further affirms its promise, demonstrating measurable successes in student flexibility and engagement (Morrison et al., 2025). However, common implementation challenges persist: increased educator workload from designing for multiple modalities, coordination complexity across synchronous and asynchronous environments, and institutional infrastructure demands (Adi Badiozaman et al., 2025; Dong, 2026; Melzer et al., 2025).

Simultaneously, intelligent educational tools such as generative AI, adaptive platforms, and AI-enhanced learning environments have emerged with capabilities directly relevant to these challenges. They can adapt content across modalities, support learners between scheduled sessions, and extend personalised support beyond what individual educators can provide alone (Ogunleye et al., 2024). Yet educators' adoption of these tools to support HyFlex implementation is hindered not by technological limitations but by the "AI" label itself, which triggers resistance, anxiety, and concerns about pedagogical displacement (Warr & Heath, 2025). The central problem this paper addresses is therefore dual: how can institutions leverage intelligent educational tools to make HyFlex implementation more sustainable, and how can focusing on pedagogical function rather than technological terminology facilitate this integration?

This paper examines how a practice-based institutional pilot addressed this dual challenge by integrating intelligent educational tools into HyFlex learning design whilst deliberately de-emphasising technological labels in favour of pedagogical outcomes. It documents how UniSQ participated in the Jisc Beyond Blended (BB) pilot whilst simultaneously running an internal HyFlex-Beyond Blended initiative (HBB). The context is particularly significant: UniSQ is a primarily online university (approximately 65% of students in online attendance mode) that was the sole non-European participant among 17 HE providers in the Jisc pilot. This positioning provides insights into how intelligent educational tools can support flexible learning in institutions already committed to digital-first approaches, whilst addressing challenges surprisingly similar to those faced by traditional campus-based universities. The paper demonstrates that intelligent tools, when framed as pedagogical supports rather than technological innovations, can augment HyFlex implementation by addressing workload, equivalency, and accessibility challenges without requiring educators to overcome "AI anxiety" as a prerequisite for adoption.

Literature review

Hyflex learning models: Foundations and evolution

The Hybrid Flexible (HyFlex) model represents a significant evolution in educational pedagogy, transforming how HE delivers content and engages students (Mahrishi et al., 2025). Conceptualised by Dr Brian Beatty (2006), HyFlex emerged as a solution to overcome limitations inherent in purely face-to-face, hybrid, or fully online courses, aiming to synthesise their respective benefits (Lindsay & Jacka, 2025). A detailed overview of the beginnings and evolution of HyFlex learning design pre-COVID revealed the need for a bridge to online learning within traditionally on-campus institutions as a key motivation for new course design approaches (Beatty, 2019a, pp. 9-19). Hybrid learning, often referred to as blended learning, combines online and on-campus in-person activities, primarily utilising synchronous learning modes. In this approach, students have some choice regarding their learning method, but they are expected to undertake the same mix of online and in-person activities (Lindsay & Jacka, 2025).

Beatty's foundational HyFlex framework rests upon four core attributes: Choice, Equivalency, Reusability, and Accessibility (Beatty, 2006). Choice empowers students to select their preferred participation mode, synchronous in-person, synchronous online, or asynchronous, often on a daily or weekly basis. Equivalency ensures all students, regardless of chosen mode, have equal opportunity to achieve learning outcomes. Reusability emphasises creating adaptable, multi-modal resources accessible across different formats. Accessibility ensures student engagement with content regardless of time, place, or mode, leveraging digital technologies and universal design principles. Real-world stories of HyFlex design and implementation across HE institutions have encouraged contextual adaptations (Beatty, 2019b).

Building upon this foundation, Lindsay & Jacka (2025) propose an adapted interpretation structured around three key attributes: Choice, Flat Learning, and Accessibility, with interconnected points of equivalency, reusability, and connected learning. Their model extends Choice beyond attendance mode selection, granting students autonomy over when, where, and how they study. Flat Learning characterises non-hierarchical environments where all voices hold equal value, aligning with social constructivist and connectivism pedagogical approaches. Their conceptualisation of Accessibility emphasises strategic use of assistive technologies and multiple content formats to accommodate diverse learners.

Benefits and challenges of HyFlex implementation

HyFlex learning represents a pedagogical approach that provides students with alternatives in how they participate in learning activities, whether synchronously or asynchronously, in-person or online (Lindsay & Jacka, 2025). Research confirms extensive benefits of the HyFlex model, enhancing student flexibility and accessibility while catering to diverse learning preferences (Mahrishi et al., 2025). Students report decreased stress, positive learning experiences, and greater educational control, as the model accommodates varied schedules and life circumstances (Bockorny et al., 2024). This flexibility proves particularly valuable for postgraduate students balancing careers and personal obligations (Mahrishi et al., 2025). Technology integration within HyFlex also prepares students for future collaborative work environments (Bockorny et al., 2024; Mahrishi et al., 2025).

Designing for HyFlex implementation can present notable challenges. Primary concerns include increased workload, as educators must design materials suitable for multiple formats, often feeling they are creating separate courses (Adi Badiozaman et al., 2025). Technology issues such as ensuring reliable connectivity, software/hardware access, and managing audio/video quality disparities between remote and in-person experiences persist (Adi Badiozaman et al., 2025; Gillis & Szabo, 2024; Nussli & Oh, 2024). Maintaining equitable engagement and community across modalities remains challenging, with issues including pseudo-attendance where students log in without genuine engagement (Gillis & Szabo, 2024).

AI integration: Enhancing HyFlex learning potential

The convergence of AI with HyFlex learning models presents significant opportunities to address traditional implementation challenges while amplifying pedagogical benefits. In HE, AI tools are providing unprecedented opportunities to enhance learning experiences, streamline administrative tasks and drive innovations (Ocen et al., 2025). This administrative efficiency directly addresses the workload challenge that represents a primary barrier to

HyFlex adoption. Generative AI (GenAI) tools, particularly since ChatGPT's release in November 2022, have revolutionised accessibility to intelligent educational capabilities and extend far beyond conversation as they can now create new content such as poems, computer codes, written texts, and anything within their capability (Yusuf et al., 2024).

The capacity for personalisation when using AI strategically aligns with HyFlex's core principle of Choice by providing adaptive learning paths that respond to individual student preferences across synchronous and asynchronous modalities. Al-Zahrani and Alasmari (2024) argue that GenAI holds transformative potential for higher education, reshaping how teaching is designed, how feedback reaches students, and how institutions manage the growing complexity of diverse learner needs. ChatGPT is a tool capable of providing "personalised feedback, explanations, and recommendations based on individual student queries", thus promoting self-directed learning (Michel-Villarreal et al., 2023, p. 10). The 24/7 availability of AI-powered support systems enhances the Accessibility principle by addressing student queries instantly, ensuring asynchronous learners are not disadvantaged. AI seems to benefit assessments by generating personalised assignments, effectively assessing and predicting students' academic achievement and non-cognitive outcomes, identifying disadvantaged students, and assessing teaching effectiveness (Liang et al., 2025).

Natural language processing capabilities support the Reusability principle through automatic content adaptation across multiple modalities, generating transcripts, summaries, and alternative format resources without additional educator workload. These benefits include the use of AI in HE to adapt instruction to the needs of different types of learners, in providing customised prompt feedback, in developing assessments, and in predicting academic success (Crompton & Burke, 2023). AI integration represents not merely a technological enhancement but a fundamental enabler of HyFlex's pedagogical promise, supporting choice, accessibility, and equivalency while addressing traditional implementation barriers through intelligent automation and personalisation.

Critical perspectives on AI in education

While AI integration offers significant potential for enhancing HyFlex learning, critical scholarship highlights important concerns that must be addressed in implementation (Warr & Heath, 2025). Questions of equity and access are paramount: AI tools may reinforce existing educational inequalities when students lack reliable internet access, appropriate devices, or digital literacy skills needed to engage with intelligent systems effectively (Ogunleye et al., 2024). The "digital divide" can be exacerbated rather than bridged when AI-enhanced learning assumes universal access to technology infrastructure (Siddiqi, 2026).

Beyond equity concerns, data privacy and algorithmic transparency present serious implementation challenges. Many intelligent educational systems collect extensive student data, raising legitimate questions about surveillance, informed consent, and whether that data may be commercialised (Williamson, 2021). A further concern is that the decision-making logic of many AI tools remains opaque - educators and students often cannot see what data is being collected, how it is weighted, or how learning outcomes are being predicted (Selwyn, 2019). These "black box" systems risk eroding both educator autonomy and student agency in the learning process.

A third concern centres on pedagogical displacement and academic integrity. Critics argue that over-reliance on AI tools risks deskilling educators, narrowing curriculum design to what intelligent systems can readily generate, and undermining the development of independent student thinking (Warr & Heath, 2025). In the HBB pilot, these concerns informed several implementation decisions: AI agents were positioned explicitly as pre-work supports rather than replacements for human design expertise, GenAI tools were framed as critical friends that enhance rather than substitute pedagogical judgement, and participants were encouraged to interrogate rather than simply accept AI-generated suggestions. These decisions do not resolve the tensions identified in this section, but they reflect a deliberate attempt to leverage AI capabilities whilst keeping pedagogy and the educator, firmly in control.

Innovation background

UniSQ's HyFlex adoption: The FlexEd approach

"Learning has evolved rapidly in recent years giving rise to the HyFlex approach; an innovative, disruptive, and necessary change in teaching and learning" (Lindsay & Jacka, 2025, p. 1). While those working in online education have long advocated for students' ability to access learning flexibly regardless of when or where they are, Beatty (2006) formalised these practices and created a framework for nurturing and growing these ideas using the term 'HyFlex'. Interestingly, other institutions refer to HyFlex practice using different labels (https://www.hyflexlearning.org/hyflexnames), whilst at UniSQ the term 'FlexEd' is gaining momentum with a refined approach centred on three key attributes: Choice, Flat Learning, and Access (Lindsay & Jacka, 2025).

At UniSQ, HyFlex implementation addresses several challenges common to flexible learning adoption: technological infrastructure requirements, increased educator workload, the need for equivalent learning experiences across modalities, and student adaptation to increased autonomy. These challenges are compounded by institutional resistance to pedagogical change and concerns about maintaining academic quality across diverse delivery modes. A particular challenge lies in terminology, with terms such as blended, hybrid, distance, online, and on-campus used but often lacking common understanding within institutions, let alone between them. The UniSQ FlexEd approach aspires to address this confusion by providing clear operational definitions whilst maintaining flexibility for institutional adaptation, supported by the open educational resource, HyFlex learning and teaching: A guide for educational innovation (Lindsay & Jacka, 2025) and a dedicated website sharing learning activities, resources, and emerging case studies (https://create.usq.edu.au/flexed/).

Beyond labels: The educational 'fragrance' of intelligent tools

The "rose problem" in educational technology lies in how terminology often creates resistance and misconceptions. When educators hear "AI", they often react to preconceptions, a form of motivated skepticism according to Gong et al. (2026), rather than examining actual pedagogical capabilities (Warr & Heath, 2025). This resistance obscures the reality that many intelligent educational tools simply enhance traditional approaches: personalisation mirrors individual tutoring, automated content creation supports resource development, and pattern recognition enables adaptive assessment feedback.

These tools demonstrate pedagogical equivalence by augmenting rather than replacing human expertise. An intelligent tutoring system "smells as sweet" as human tutoring when it provides personalised guidance and feedback. Content generation tools enhance educator capacity rather than diminishing pedagogical skill. The educational effectiveness, the "sweet fragrance", remains constant regardless of whether they are labelled as AI, adaptive systems, or simply good educational technology. The key insight emerging from this pilot is that focusing on educational outcomes rather than technological labels reveals true pedagogical value. This perspective is reinforced by recent HyFlex scholarship repositioning the model itself as a design frame that amplifies existing pedagogical goals rather than supplanting them (Beatty, 2026), a principle that extends naturally to the intelligent tools integrated within it.

The Jisc Beyond Blended framework

The Joint Information Systems Committee (Jisc) (https://www.jisc.ac.uk/about-us) was established in 1993 to support post-secondary education and research, primarily focusing on information and communications technology. Jisc has made a significant impact in the HE sector through innovative projects supporting new approaches to learning. During the pandemic, they observed that educators struggled to capitalise on online environments, prompting the Beyond Blended (BB) framework to extend learning from that period. This comprehensive framework identified four aspects of learning (time/pace, space/place, learning materials, and group relationships), four modes of participation (live online, live in place, asynchronous online, asynchronous in place), and six pillars for curriculum design (Place, Platform, Pace, Blend, Flex, and Support). The framework's intention was to create a shared vocabulary to operationalise theoretical understandings of contemporary best practice. As Beetham et al. (2025, p. -8) noted, "all learning is potentially blended" through the inclusion of contemporary tools that release learning from temporal and spatial constraints. The Jisc BB vocabulary enabled meaningful conversations between educators, students, and institutional stakeholders about pedagogical value and implementation strategies, providing structure for the complex decisions facing post-pandemic curriculum design. The resulting BB pilot is research-informed and based on the BB report (Beetham et al., 2025), representing phase two of Jisc's research into curriculum and learning design in HE in the UK.

UniSQ and Beyond Blended / Hyflex

The synergy between UniSQ's emerging HyFlex design and Jisc's Beyond Blended pedagogical approaches created opportunities to explore both challenges and positive outcomes. The framework's emphasis on pedagogical differences between in-place and online learning, balanced with flexibility for specific student needs, aligned closely with HyFlex principles while providing structured guidance for implementation.

In 2024, UniSQ was invited to join the Jisc BB pilot, leveraging Jisc webinars, support meetings and reports as well as resources, including adapting curriculum materials and graphics to align with local needs. Of the 17 HE institutions in the pilot, UniSQ was the only non-UK or EU university, and already well placed in online education provision through its ongoing digital-first approach. The publication of an open book, HyFlex learning and teaching: A guide for educational innovation (Lindsay & Jacka, 2025), and the FlexEd website (https://create.usq.edu.au/flexed/) provided additional resources to support this uniquely UniSQ HyFlex adoption.

Implementation context and design approach

This paper adopts a Scholarship of Teaching and Learning (SoTL) approach (Boyer, 1990), incorporating structured reflection of practice within a university-wide HyFlex innovation pilot. The focus is on learning design processes, pedagogical decision-making, and implementation patterns emerging from collaborative professional practice, rather than on the systematic study of individual participants as research subjects.

Insights presented in this paper were generated through iterative design processes, ongoing practitioner reflection, and collaborative sense-making embedded within the pilot's professional learning activities. Drawing on Brookfield's (1995) model of critical reflection, the pilot employed multiple reflective lenses: colleagues' perspectives through regular collaborative sessions, learning design team observations documented in meeting records and design consultation notes, and engagement with the scholarly literature on HyFlex and AI integration in education. Participants met regularly throughout each trimester to share progress, discuss challenges, and collaboratively refine their approaches to HyFlex design.

Design insights were documented through several sources: notes from one-on-one learning design consultations, records from regular group sharing sessions, observations by the pilot facilitators during collaborative workshops, and participants' reflections on their experiences using digital tools and AI agents. These materials formed the empirical basis for the synthesised observations presented in this paper. The synthesis process involved the authors reviewing patterns across consultation notes and workshop discussions, identifying recurring themes in participants' experiences with specific tools and approaches, and triangulating these patterns with existing literature on HyFlex implementation and AI integration.

The work does not constitute human-participant research as defined by national ethics guidelines. Participants engaged in routine professional practice, curriculum development, and educator professional learning as part of their normal teaching roles. No research instruments, experimental interventions, or identifiable participant data were employed. Observations are presented at an aggregate level, reflecting collective experiences and design patterns rather than individual participant accounts. This approach aligns with established methodologies in the scholarship of practice in higher education (Hutchings & Shulman, 1999).

The HyFlex Beyond Blended (HBB) pilot structure

To meet Jisc BB requirements while pursuing internal learning design goals, UniSQ launched the HBB pilot through a university-wide open invitation, resulting in a multi-disciplinary group of participants. Pilot goals included helping educators navigate the complexities of balancing student needs, pedagogical variation, and flexible delivery using HyFlex design approaches, along with the integration of digital technologies and active engagement with Jisc materials.

The pilot was structured around the first two of UniSQ's three 13-week trimesters in 2025, providing distinct intervention cycles:

Trimester 1 involved 12 educators spanning five disciplines and 14 courses. Participants defined personal goals and received support through one-on-one consultations. Shared learning occurred during regular group sessions. Formative insights emerged through informal reflective processes embedded within the pilot's professional learning activities.

Trimester 2 built upon lessons from the first phase with five participants. The approach was refined to include collaborative and individual meetings for progress sharing, feedback exchange, and discussion of challenges and innovations. Ongoing reflective sense-making occurred throughout the pilot to inform iterative refinement of learning design approaches.

In T1 and T2, a total of 3,916 students at UniSQ were involved in the pilot.

Participants designed their goals around the SMART (Specific, Measurable, Achievable, Relevant, Time-Bound) framework. These mapped to one or more of four UniSQ priority areas, thus:

1. Improving Student Engagement and Collaboration.
2. Establishing Hybrid and Hyflex Learning Environments.
3. Enhancing Student Learning Experience.
4. Integrating Asynchronous Learning Tools.

Digital technologies and AI integration

A goal of the HBB pilot was to integrate digital technologies, including intelligent tools and AI, to support teaching and learning and improve student outcomes. This goal was in conjunction with the 'digital first' learning design embedded at UniSQ, where courses are designed for online and digital learning immersion 'first', including learning management system templates, multimodal content, and active learning artefacts. Significantly, many existing educational technologies increasingly incorporate intelligent features, making the integration less about adopting "AI tools" and more about leveraging enhanced capabilities within familiar platforms.

Typology of intelligent tools

The pilot integrated intelligent capabilities across four functional categories based on pedagogical role. Intelligent learning platforms incorporated AI-enhanced features within synchronous environments: Engageli provided automated class summaries, auto-generated polls, real-time analytics, and a 'Playback' room feature enabling individuals or groups to review recordings, take notes, and discuss assessments asynchronously. Content generation tools automated multimodal content creation: Synthesia for avatar-based videos, Nolej for interactive H5P elements, and institutional GenAI tools (Co-Pilot within UniSQ's Microsoft environment, and Cogniti, adopted by UniSQ in 2024). Conversational AI systems encompassed both chatbots designed for routine student queries (course information, lecture times) and AI agents capable of nuanced curriculum design dialogue (the HyFlex Helper and Beyond Blended Buddy agents developed for the pilot). Collaborative platforms without AI-specific features (Padlet, VoiceThread) supported artifact creation, socialisation of learning, and peer-to-peer interaction. This typology distinguishes tools by pedagogical function rather than technical architecture, aligning with the pilot's emphasis on purpose over technological labelling. Participants selected tools appropriate to their specific learning design goals rather than adopting all capabilities uniformly.

Stepping out of comfort zones

All participants were encouraged to extend beyond their usual technology comfort zones. Engageli was leveraged as a tool that everyone was requested to use due to its capabilities in enhancing both synchronous and asynchron-

-ous learning experiences without requiring participants to learn entirely new systems. The use of Engageli highlighted both affordances and constraints associated with synchronous learning platforms, underscoring the importance of onboarding, infrastructure, and contextual alignment.

Synthesia for avatar-based video creation and Nolej for interactive H5P element development were leveraged to expand teaching approaches. One Law educator utilised GenAI capabilities to create realistic text-based scenarios, then extended these to video format using Synthesia due to its creation ease. This demonstrates how intelligent tools can amplify educator creativity and productivity while maintaining pedagogical quality. GenAI tools also served as critical friends, helping flesh out ideas and critique thinking approaches - particularly valuable when traditional knowledge and tools seemed insufficient for addressing pedagogical challenges.

AI agents: Digital guides for learning design

A significant innovation involved designing and trialling AI chatbots and agents, to support HyFlex-focused curriculum development and complex conversation unpacking. This study distinguishes chatbots (designed for simple repetitive tasks) from AI agents (capable of handling nuanced, complex questions). Chatbots function like vending machines, whilst agents operate more like a café barista. Some participants developed a chatbot to help students find relevant information within online learning materials, providing 24/7 support that reduced reliance on immediate educator responses.

This led to the exploration of Cogniti (https://cogniti.ai/), an Australian AI product developed by the University of Sydney and hosted on the Microsoft Azure platform, which, according to Memon and Kwan (2025, p. 9) "exemplifies the collaborative model of Human-GenAI integration in education". Cogniti made possible the development of "HyFlex Helper" and "Beyond Blended Buddy" agents. Both were created in 2025 to assist in redesigning learning activities by aligning them with HyFlex attributes. These provided rapid, interactive pre-work that enabled exploration of how existing ideas fit within the HyFlex framework and facilitated deeper discussions with support teams. For more complex curriculum design support, the FlexEd Felix AI Agent was developed in phase two of BB using Lindsay and Jacka (2025)'s open book and ChatGPT Pro. Although it is a more 'powerful' agent, non-subscription access to ChatGPT limited its reach. In 2026, FlexEd Felix was transferred to BoodleBox, an AI tool being piloted at UniSQ, giving participants full access to the affordances of this agent.

Discussion: Roses in different gardens

Professional development (PD) and pedagogical transformation

A key feature of the HBB pilot was the approach to PD that offered both individual and group opportunities to discuss and build competency. In addition to one-on-one mentoring sessions, participants joined an active Community of Practice that ensured regular sharing, collaboration and peer support. PD opportunities included both technical skills for tool utilisation and pedagogical frameworks for effective integration.

The AI agents proved particularly valuable for PD, allowing educators to quickly understand how existing ideas aligned with HyFlex principles and providing groundwork for deeper discussions with support teams. The pilot revealed patterns of workload redistribution and deeper engagement with HyFlex principles through supported design processes.

Educator workload reduction was evident in several areas. Automated content creation capabilities enabled rapid development of learning materials, while AI agents handled routine HyFlex inquiries. During informal feedback sessions, it was reported that AI agents enabled more frequent, incremental engagement with learning design questions between formal support sessions, providing utility for ongoing, just-in-time support. Pedagogical practice changes included increased comfort with flexible delivery modalities and enhanced understanding of learning design principles. Participants reported greater confidence in creating equivalent learning experiences across different attendance modes, supported by intelligent tools that helped identify alignment opportunities and enhancement possibilities.

Institutional benefits and implementation insights

Strategic integration of intelligent tools supported HyFlex principles of choice, flat learning, and accessibility across both synchronous and asynchronous modalities. A particular shift occurred in how participants understood equivalency, moving from an assumption that asynchronous simply meant recorded content, toward designing genuinely parallel learning experiences regardless of when or how students engaged. Participants at first lacked a clear understanding of what this meant and therefore struggled to design for asynchronous learners. The realisation that watching a video recording post-tutorial is not the same as having in-class real-time interaction (whether on-campus or virtual) was an ongoing discussion. For asynchronous learning, emerging AI chatbots provided 24/7 student support, addressing queries instantly to ensure asynchronous learners were not left waiting for human interaction. This directly mitigates student isolation in asynchronous modes by emulating interaction with peers and instructors, aligning with BB's recognition that online and in-person represent different pedagogic spaces requiring distinct integration strategies.

In synchronous hybrid sessions where students chose to come onto campus or attend virtually, intelligent features in Engageli provided immediate interactive capabilities. Participants used Engageli's polls, whiteboards, and annotation features to break up content and increase engagement for both synchronous and asynchronous students. Auto-generated polls and real-time analytics enabled educators to gauge understanding and adapt instruction dynamically, while class summaries ensured persistent access to session insights. Collaborative activities using shared embedded Google Docs in hybrid sessions leveraged Engageli's Q&A feature to capture student input persisting beyond live sessions. This approach ensured that traditional live settings enabled meaningful participation and contribution from both online and in-place students, with prompt feedback bridging physical and virtual divides.

Juxtaposed with AI integration successes, physical infrastructure limitations posed barriers to hybrid implementation. This emerges as a recurring constraint, particularly in physical teaching spaces not designed for hybrid engagement. The physical challenges prompted many group and individual conversations around the differences and similarities between hybrid and HyFlex learning, how to manage a hybrid class with one "teacher" in the room, and how to 'join' both sets of students for interaction and collaboration during the synchronous session rather than treating them as separate cohorts.

From an institutional perspective, AI integration offered scalability and cost-effectiveness. Participation in the pilot improved communication between Learning & Teaching Futures and ICT Services, strengthening long-term capacity for technology-pedagogy integration. Jisc affiliation raised both the visibility and credibility of educational technology initiatives across the university. GenAI tools provided insights and ideas that would typically require extended time for development. Fast-tracking these processes enabled deeper understanding through exploration in shorter timeframes, suggesting potential for institutional efficiency gains at scale.

Long-term sustainability planning includes integration of intelligent agents, such as Cogniti, directly into the university's LMS as "inline" tools rather than external links, with options for developing custom agents for specific courses. This approach aimed to embed intelligent capabilities within familiar workflows rather than requiring separate system management.

Challenges, limitations, and unresolved tensions

Alongside the successes documented above, the pilot revealed several significant challenges and unresolved tensions that merit candid discussion. Infrastructure limitations proved more intractable than anticipated. Physical teaching spaces designed for traditional lecture delivery could not support genuine hybrid engagement. Fixed camera setups failed to follow an instructor's movement beyond the lectern, limiting visibility for online students. Even with Engageli's sophisticated features, educators in rooms with poor acoustics and inflexible technology found it nearly impossible to create equivalent experiences for in-person and online students simultaneously. Balancing real-time attention between online table groups and face-to-face students proved demanding, with instructors struggling to provide equitable support across modalities.

Platform adoption encountered resistance despite pedagogical framing. Whilst the "rose by any other name" approach reduced AI anxiety for some participants, student responses to Engageli were mixed. Some found the platform confusing and requested traditional formats, with complaints that interactive features interrupted their preferred multitasking during tutorials. The requirement to use Engageli rather than familiar platforms like Zoom created friction, with students requesting recordings be moved to Panopto for offline viewing, thereby defeating the platform's interactive Playback purpose. Educators also cited time poverty as a barrier: learning Engageli's full capabilities whilst managing existing teaching demands proved overwhelming, leading to an underutilisation of the platform's features.

The flexibility-engagement paradox emerged as an unexpected tension. Increased flexibility raised concerns about decreased synchronous participation, with students questioning why they should attend live sessions when content was available asynchronously. One participant's experiment alternating campus schedules to increase flexibility actually lessened engagement, suggesting that excessive flexibility may undermine the collaborative learning HyFlex aims to support. This tension between student choice and maintained engagement remained unresolved within the pilot.

The absence of systematic student feedback represents a significant limitation. Whilst 3,916 students experienced the pilot interventions, formal student perspectives were not captured. No student survey responses were received in Trimester 1. Educator observations suggested mixed student experiences, but without systematic student voice, claims about enhanced engagement and equivalency remain tentative and based primarily on educator perceptions rather than learner evidence.

Scope and sustainability constraints limited implementation depth. Time pressures during active teaching periods meant participants could not engage fully with training, develop comprehensive asynchronous learning activities, or carefully plan implementation. Some participants withdrew from Trimester 2 citing being overwhelmed. The pilot's small scale (17 educators across 8 schools) and reliance on dedicated learning design support raise questions about scalability without similar resourcing. A significant university-wide change process beginning toward the end of Trimester 1 also affected participation and sustainability planning.

Finally, divergent pedagogical philosophies emerged. Some participants questioned whether true blending is optimal, suggesting instead that institutions should offer completely separate pathways: full on-campus experiences for those wanting in-person learning, and dedicated online options for others, rather than attempting to integrate modalities. This fundamental disagreement about whether HyFlex's core premise (integrated choice across modalities) serves students better than distinct pathways remains unresolved and warrants further investigation.

From anxiety to everyday practice

A shift toward framing intelligent tools as pedagogical supports rather than novelties appeared to reduce resistance and normalise their use in learning design. Making AI a routine part of teaching helped participants regard it as another resource rather than something exceptional. Educators reported increased confidence in using synchronous platforms to enhance interaction and participation.

Reflections from pilot activities highlighted the development of real-time responsiveness, technological fluency, and a rethinking of traditional classroom dynamics whereby online and in-person students could be equally seen and supported. In HyFlex contexts, the change of focus moves the conversation from AI as a novelty to AI as part of everyday pedagogy: tools assessed not for their technical sophistication, but for how well they enable choice, flat learning, and access. Over time, AI becomes embedded and unobtrusive, quietly enhancing good teaching without overshadowing it.

Practical implications: Cultivating educational gardens

The HBB pilot revealed several best practices for an intelligent tool integration within HyFlex frameworks. Implementation worked best when technology served pedagogy (Mishra & Koehler, 2006; Ogunleye et al., 2024), ensuring that digital tools were selected only when they added clear instructional value to the defined learning obj-

-ectives. This 'pedagogy-first' approach, supported by tailored training and Communities of Practice, was essential in reducing educator resistance. The most effective integrations occurred when intelligent capabilities enhanced existing good teaching practices rather than attempting to replace them entirely. Future HyFlex design could embed structured student consultation to validate assumptions about mode preference and engagement patterns. Change management strategies proved crucial, particularly the importance of addressing varying educator readiness levels and providing tailored support. The establishment of Communities of Practice enabled peer learning and reduced resistance by demonstrating practical applications rather than theoretical possibilities.

PD recommendations include blending technical and pedagogical skills rather than treating them separately. Educators need an understanding of both tool capabilities and pedagogical frameworks for effective integration. The pilot suggests that just-in-time support through intelligent agents can supplement traditional PD by providing ongoing, context-specific guidance. Resource allocation considerations include balancing investment in intelligent tools with infrastructure improvements necessary for HyFlex and hybrid delivery. The pilot highlighted that technology cannot overcome fundamental infrastructure limitations, particularly in physical spaces designed for traditional teaching modalities.

Implementing HyFlex with AI integration returns us to Shakespeare's garden. Just as a rose requires fertile soil, water, and careful tending to reveal its fragrance, intelligent educational tools require strong pedagogical principles, adequate support, and thoughtful integration to reveal their value. The goal is not to fill the garden with exotic new species, but to cultivate conditions where all learning, whether live or independent, in-person or online, can flourish with the same sweet fragrance of accessibility, choice, and equivalency, regardless of the technological names we assign to the tools that support it.

Conclusion: What's in a name?

This study has demonstrated that intelligent educational tools enhance good pedagogy when thoughtfully integrated, revealing their value through the principles they serve rather than the labels they carry, and indeed, as Shakespeare's Juliet might confirm, 'smell as sweet' regardless of their technological labelling. When UniSQ educators and students moved beyond 'AI anxiety' to focus on educational outcomes, they discovered that these tools enhanced rather than replaced good pedagogical practice, supporting the core HyFlex principles of choice, flat learning, and access. In discipline contexts such as healthcare education, the pilot highlighted the relevance of HyFlex design for preparing learners for digitally mediated professional environments.

The pedagogical essence, meaning what truly matters, is educational effectiveness, not technological terminology. The HBB pilot revealed that strong learning design emerges when intelligent tools are integrated thoughtfully within established educational frameworks, serving pedagogy rather than driving it. This work makes three theoretical contributions to the literature on technology-enhanced learning (TEL) and HyFlex implementation. First, it demonstrates that framing matters: intelligent educational tools are more readily adopted when positioned as augmentations to established pedagogical frameworks (HyFlex's Choice, Flat Learning, and Accessibility) rather than as disruptive technological innovations requiring paradigm shifts. Second, it extends HyFlex theory by showing how AI capabilities can operationalise HyFlex principles that have been theoretically sound but practically challenging, particularly Equivalency across modalities and Reusability of learning resources, thereby moving HyFlex from an aspirational framework to sustainable practice. Third, it contributes to Scholarship of Teaching and Learning (SoTL) methodology by demonstrating how critical reflective practice (Brookfield, 1995) can generate valid insights from institutional pilots without requiring formal research protocols, offering a model for practice-based inquiry in contexts where traditional research ethics frameworks may inhibit knowledge sharing. The "rose" of enhanced learning maintains its sweet fragrance whether these capabilities are called AI, adaptive systems, or simply good educational technology.

For practitioners, the core insight is that HyFlex represents a necessary transformation in teaching and learning that becomes more sustainable when intelligent tools are integrated in service of pedagogical goals rather than as ends in themselves. A phased approach, beginning with single-platform mastery before layering AI-enhanced asynchronous support, was identified as the most sustainable pathway, with the planned embedding of agents such as Cogniti directly into the LMS exemplifying this principle. Scalability across disciplines appears strong but requires institutional commitment to infrastructure and professional development.

While this pilot was conducted at a predominantly online university with established digital infrastructure, the approaches described are transferable to diverse institutional contexts under specific conditions. For traditional campus-based universities with less developed online infrastructure, the phased implementation strategy, beginning with single-platform mastery (such as a synchronous learning environment) before layering AI-enhanced asynchronous support, offers a sustainable pathway that does not require wholesale infrastructure transformation. The Communities of Practice model and just-in-time AI agent support are particularly transferable, as they reduce reliance on extensive learning design staffing whilst building internal capacity. For resource-constrained institutions, the focus on pedagogical function over technological novelty becomes even more critical: prioritising freely available or institutionally licensed AI tools (such as those embedded within existing learning management systems) over premium platforms can achieve similar pedagogical outcomes at lower cost. However, successful transferability depends on several enabling conditions: institutional commitment to educator professional development, basic technological infrastructure supporting synchronous and asynchronous learning, and leadership willing to frame intelligent tools as pedagogical supports rather than technological impositions. The approaches are less transferable to contexts where foundational digital infrastructure is absent, where educators lack autonomy over pedagogical decisions, or where institutional cultures prioritise compliance over pedagogical innovation. Future implementations should adapt the HyFlex-AI integration framework to local contexts whilst maintaining the core principle: that intelligent educational tools, when positioned as means to pedagogical ends rather than ends in themselves, can make flexible learning more sustainable across diverse institutional settings.

This pilot surfaces several researchable questions warranting systematic investigation. First, what is the optimal sequencing and pacing for introducing intelligent tools within HyFlex implementation? The phased approach identified here (platform mastery before AI layering) requires empirical validation across diverse contexts. Second, how do different framings of AI tools affect educator adoption and pedagogical integration? Comparative studies examining outcomes when identical tools are introduced as "AI innovations" versus "pedagogical supports" could test the framing hypothesis central to this work. Third, what is the student experience of AI-augmented HyFlex learning, particularly regarding equivalency across modalities? This pilot focused on educator perspectives; a systematic study of student engagement, satisfaction, and learning outcomes across AI-enhanced synchronous, asynchronous, and in-person pathways remains critically needed. Finally, under what conditions do AI agents effectively support professional learning versus when do they create dependency or deskilling? Longitudinal research tracking educator development trajectories with and without AI agent support would clarify the long-term implications for pedagogical expertise and professional autonomy.

Moving forward, the challenge is not whether to integrate these capabilities, but how to do so thoughtfully and pedagogically. In education, as in Shakespeare's garden, the essence is what matters, not the name. The sweet fragrance of enhanced learning: accessible, flexible, and personalised through choice and equivalency, remains the true measure of success. The rose, by any other name, would smell as sweet. So too does effective learning design and inclusive, student-centred education, whatever name is chosen to call the intelligent tools that help educators achieve it.

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This paper reports on a practice-based learning design innovation and institutional pilot conducted within a Scholarship of Teaching and Learning (SoTL) framework. It does not constitute human-participant research as defined by national ethics guidelines. Participants engaged voluntarily in professional learning as part of their normal teaching roles.

Insights are derived from documentation of routine professional practice (learning design consultations, collaborative workshops, reflective discussions). No research instruments or experimental interventions were employed, and observations are reported at aggregate level. Participants were informed that aggregated insights might inform scholarly outputs on learning design practice.

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