Hybrid Learning Design Toolkit: A Framework for Hybrid Teaching and Learning Design

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1. Introduction

The Hybrid Learning Design Toolkit is a **research-informed design project** created by learning experience designers to support educators in developing effective hybrid learning experiences. This **conceptual synthesis** translates research findings into a collection of **practical and actionable** learning design **tools**.

Hybrid learning has evolved from an experimental approach to a mainstream educational model, accelerated by the COVID-19 pandemic but sustained by its pedagogical and strategic benefits. The pandemic created an unprecedented global experiment in remote and hybrid education, revealing both the challenges and potential of teaching across physical and virtual spaces simultaneously. While emergency remote teaching exposed significant obstacles—from digital divides to "Zoom fatigue"—it also demonstrated the value of flexible learning models that can accommodate disruptions while maintaining educational continuity both for student and instructors (Fabian et al., 2024).

Post-pandemic research shows that while students generally prefer face-to-face learning for engagement, they highly value the flexibility of hybrid options (Wagner et al., 2023; Fabian et al., 2024). Many universities have incorporated hybrid learning into their strategic plans, viewing it not as an emergency measure but as a core component of educational delivery that enhances accessibility and resilience (Griffin et al., 2022). A shift from technology-centered to pedagogy-centered approaches emphasizes that effective hybrid learning requires not just appropriate technology but intentional pedagogical designs that prioritize equity, care, and student partnership (Bülow, 2022; Penrod, 2023).

Definition and Scope

For clarity, this toolkit defines hybrid learning as educational experiences that integrate simultaneously both physical and virtual learning environments. Within this broad definition, we specifically address:

- **Synchronous Hybrid Learning (SHL)**: Learning environments where both on-site and remote students simultaneously attend learning activities (Raes et al., 2020)
- **Remote Classroom Model**: Connecting groups of students in different physical locations synchronously
- **Hybrid Virtual Classroom**: Connecting on-site students with individual remote students participating from various locations
- **HyFlex (Hybrid-Flexible) Model**: Offering every class session and learning activity in multiple modes with students choosing their participation mode (Beatty, 2007)
- **Rotational Hybrid Models**: Systems where students alternate between in-person and online attendance according to a predetermined schedule

Who Is This For?

This toolkit is designed for **educators and learning designers** who are actively teaching or designing hybrid learning experiences. Whether they're **individual instructors** adapting their courses, **learning designers** supporting faculty, or part of a **teaching team** exploring hybrid approaches, the tools provide practical resources for immediate implementation. **No prior expertise** in hybrid teaching is required — different implementation levels are outlined that **teachers and instructors where they are**.

The toolkit works across **all disciplines and subject areas** — from laboratory sciences to discussion-based seminars, from skill-based training to theoretical explorations. It's equally relevant whether they teach **mathematics, literature, engineering, arts, or professional practice** courses.

2. Research Foundations & Design Philosophy

This toolkit emerges from a **comprehensive synthesis** of contemporary research on hybrid learning, drawing from **multiple bodies of literature** that converge on the challenges and opportunities of teaching across physical and virtual spaces. The approach integrates findings from **empirical studies** on synchronous hybrid classrooms, **theoretical frameworks** for understanding presence and engagement in distributed learning environments, and **practical wisdom** from post-pandemic educational transformations.

Core Theoretical Frameworks

The toolkit integrates multiple established theoretical approaches and practical frameworks that inform our understanding of effective hybrid learning:

Community of Inquiry Framework (CoI) (Garrison et al., 2000) provides the foundation for understanding the three essential forms of "presence" in hybrid learning: teaching presence, social presence, and cognitive presence. CoI research revealed that these presences don't emerge automatically in hybrid contexts — they require active cultivation through skilled facilitation. Without intentional facilitation strategies, hybrid environments tend toward fragmented experiences where remote students become "peripheral participants" with diminished access to all three types of presence.

Spatial Pedagogy (Bülow, 2022) has been instrumental in shaping the Toolkit understanding of hybrid learning spaces. This framework recognizes that hybrid learning creates three distinct yet interconnected presence contexts: the physical classroom, the digital platform, and the diverse contexts of remote learners.

Activity-Centered Analysis and Design (ACAD) (Goodyear, Carvalho, & Yeoman, 2021) provides a sophisticated lens for understanding how learning environments function through the integration of set design (physical-technological environment), social design (roles and interactions), and epistemic design (learning activities). ACAD recognizes that technology and space alone don't create learning — it's the facilitated activities within those spaces that generate educational experiences.

Technology Integration Frameworks including TPACK (Mishra & Koehler, 2006), SAMR (Puentedura, 2006), and RAT (Hughes et al., 2006) inform the understanding of how educators adopt and integrate technology into their practice. These frameworks helped shape a scaffolded implementation approach, recognizing that sustainable adoption happens incrementally rather than through radical transformation.

Innovation Adoption and Educator Readiness: The Stages of Concern model (Hall & Hord, 2015) provides crucial insights into how educators experience innovation adoption, recognizing that teachers move through predictable stages from awareness through collaboration and refocusing. This understanding, combined with the Stages of Technology Adoption (Christensen & Knezek, 1999) which addresses emotional and psychological dimensions of technology readiness, informed a scaffolded approach that meets educators where they are in their adoption journey.

Learning Design Approaches and Methodologies: The toolkit synthesizes insights from multiple established learning design approaches: - **Laurillard's Conversational Framework** (Laurillard, 2002) with its six learning types (acquisition, discussion, investigation, practice, collaboration, production) provides a comprehensive typology for designing varied learning activities - **ICAP Framework** (Chi & Wylie, 2014) provides the cognitive engagement progression adapted into our three practical levels: Receiving, Responding, and Creating - **Constructive Alignment** (Biggs, 1996) ensures integration of learning outcomes, activities, and assessment - **ABC Learning Design** (Young & Perović, 2016) offers a rapid course design methodology well suited for collaborative workshops that uses storyboards and cards for quick session of structured brainstorming and course co-design - **Carpe Diem** (Salmon & Wright, 2014) and its evolution **CAIeRO** (Usher et al., 2018) provide collaborative workshop approaches similar to ABC for learning design that influenced the Hybrid Toolkit card-based tools - **Viewpoints** (Nicol, 2012) demonstrates card-based rapid prototyping for course design

Design Methodology

This toolkit represents the **intersection of user experience design and learning design expertise**. Every component has been crafted with careful attention to **cognitive load**, **visual hierarchy**, and **practical usability**. UX principles like **progressive disclosure** and **information architecture** are appplied to make complex pedagogical concepts accessible and practical without oversimplification.

The use of **card-based tools** and **visual canvases** builds on a rich tradition in design fields — from IDEO's pioneering Method Cards to the hundreds of specialized design toolkits documented in recent research (Roy & Warren, 2019; Wölfel & Merritt, 2013). This approach has proven effective for translating complex concepts into **actionable design decisions**, whether in service design, UX, or educational contexts.

3. The Hybrid Learning Challenge

A comprehensive scan of hybrid learning literature revealed a complex landscape of interconnected challenges that educators face when teaching across physical and virtual spaces simultaneously.

Persistent Challenges

Technical and Environmental Barriers: Audio quality problems and internet connectivity emerge as the most significant technical obstacles in synchronous hybrid settings (Wagner et al., 2023; Raes et al., 2020). Beyond basic connectivity, educators struggle with equipment management, camera and microphones positioning, creating and managing learning environments that serve both physically present and remote participants equally.

Pedagogical Adaptation Struggles: Many instructors find themselves reverting to lecture-based approaches when faced with the complexity of hybrid delivery, despite recognizing the need for interactive and collaborative activities. The challenge of redesigning learning experiences that work effectively across modalities proves overwhelming without structured support (Handayani & Sulastri, 2022).

Cognitive Overload for Instructors: The phenomenon of "hyper-focus" or "hyper-zoom" describes the significant cognitive challenges teachers face when attempting to manage both physical and virtual classrooms simultaneously (Raes et al., 2020). Extended experience with hybrid teaching has documented this cognitive burden affects teaching quality and instructor wellbeing, making support structures and workload management strategies essential components of sustainable hybrid teaching (Handayani & Sulastri, 2022).

Communication and Interaction Barriers: Creating meaningful interaction between on-site and remote participants remains one of the most persistent challenges, with communication often fragmenting along modality lines (Romero-hall & Vicentini, 2017).

Engagement and Equity Disparities: Remote students consistently report feeling like "second-class citizens," experiencing lower levels of engagement, motivation, and social presence compared to their on-site peers (Raes et al., 2020; Romero-hall & Vicentini, 2017). Ensuring fair and equivalent assessment experiences across different participation modes continues to challenge educators, raising questions about validity and comparability (Handayani & Sulastri, 2022).These engagement disparities create fundamentally inequitable learning environments.

Accessibility and Digital Inclusion Barriers: The shift to hybrid learning has exposed and often exacerbated existing accessibility challenges, creating new barriers for students with disabilities while highlighting persistent digital divides. Students with visual impairments struggle with inadequate screen reader compatibility across multiple platforms, while those with hearing impairments face compounded difficulties when poor audio quality intersects with inadequate captioning services or multi-channel delivery. The cognitive load of navigating multiple digital interfaces simultaneously can be particularly challenging for students with learning disabilities or attention disorders. Additionally, the assumption of reliable internet access and appropriate devices creates systemic barriers for economically disadvantaged students. The need to self-advocate becomes more complex when students must navigate both physical and digital accessibility requirements, often without clear institutional policies or support structures designed for hybrid contexts. These multifaceted accessibility challenges require comprehensive Universal Design for Learning approaches

that go beyond simple accommodations to fundamentally reimagine how hybrid learning can be inclusive from the outset (CAST, 2018).

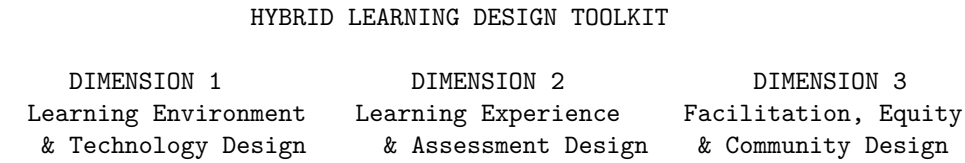
4. The Three-Dimensional Solution Framework

From the analysis of literature clear patterns emerged. The challenges clustered around three fundamental aspects of the hybrid learning experience:

- some challenges related primarily to the **environmental, physical and technological infrastructure** needed to connect spaces
- others centered on the need of **pedagogical redesign** for effective hybrid learning
- A third set focused on the **facilitation and community management** elements needed for meaningful individual and social connection, equity, and community support across modalities.

This pattern recognition led to the development of a three-dimensional framework that addresses these challenge clusters systematically.

Rather than treating hybrid learning difficulties as a monolithic problem requiring a single solution, effective support tools must acknowledge the distinct yet interconnected nature of these challenge areas. The proposed three-dimensional framework provides targeted support while contributing to a comprehensive toolkit for hybrid learning design.



Dimension 1: Learning Environment & Technology Design

This dimension addresses the foundational challenge of creating **integrated learning spaces** where physical and virtual participants can **engage equally**. It helps educators move beyond basic video conferencing to design environments that acknowledge Bülow's (2022) **"triple presence"**—the physical classroom, the digital platform, and the diverse contexts of remote learners. Experience during emergency remote teaching revealed the critical importance of reliable audio as one of the foundations of effective hybrid learning, with post-pandemic planning now prioritizing robust audio solutions above other technology investments (Wagner et al., 2023).

Dimension 2: Learning Experience & Assessment Design

Effective hybrid learning requires more than adapting traditional activities for dual delivery—it demands **purposeful redesign** of how to structure learning experiences. This dimension helps educators create activities that work **seamlessly across modalities** while maintaining **equivalent learning outcomes**. The proposed approach synthesizes insights from multiple instructional design traditions, creating a workflow for designing activities that progress through **multiple levels of cognitive engagement** based on the ICAP framework (Chi & Wylie, 2014) and Laurillard's Conversational Framework (Laurillard, 2002).

Dimension 3: Facilitation, Equity & Community Design

The **social and affective side** of hybrid learning presents unique challenges — remote students often feel **disconnected**, instructors struggle to **manage attention** across spaces, and building community seems nearly impossible. Prolonged periods of remote and hybrid learning during the pandemic revealed these challenges acutely, with social isolation making community building even more critical. This dimension provides concrete strategies for creating **genuine connection** and ensuring **equitable participation** regardless of

location, including icebreakers, dialogic interaction exercises, energizing activities, developed in response to "Zoom fatigue" and varied participation modes to maintain student attention and wellbeing.

Facilitation as a Central Integrating Force: The research synthesis revealed that facilitation is not simply another element of hybrid teaching — it is the critical mechanism that transforms disconnected spaces into unified learning experiences. Without skilled facilitation, even the best technology (Dimension 1) and most carefully designed activities (Dimension 2) fail to create genuine learning communities. As Shea et al. (2006) noted, "directed facilitation" actively cultivates presence across spaces. In hybrid contexts, facilitation must be intentionally designed to: - Bridge the physical-digital divide through verbal and visual connection strategies - Distribute attention equitably across all participants regardless of location - Create shared experiences that transcend spatial boundaries - Transform potentially isolating technology into connecting tissue

This is why facilitation features prominently across all three dimensions—it's the thread that weaves them together—but receives dedicated focus in Dimension 3 wher the human elements of connection, equity, and community that facilitation makes possible are addressed.

5. A Scaffolded Implementation Approach

One of the most significant challenges educators face when approaching hybrid teaching is knowing where to begin. The sheer complexity of simultaneously managing physical and virtual learning spaces can feel overwhelming, often pushing educators defaulting to plain frontal lecturing. This is precisely why the Hybrid Learning Design Toolkit adopts a scaffolded implementation approach — one that recognizes that sustainable change happens incrementally rather than through radical transformation.

Theoretical Grounding

This scaffolded approach emerges from the intersection of several traditions:

Change Management Theory, particularly Kotter's (1996) work on organizational transformation and Hiatt's (2006) ADKAR model, demonstrates that successful adoption requires meeting people where they are and providing clear, achievable next steps.

Adult Learning Principles articulated by Knowles (1975) emphasize that adult learners need to see immediate relevance and maintain agency in their learning journey.

Technology Adoption Models including SAMR (Puentedura, 2006), RAT (Hughes et al., 2006), and Stages of Technology Adoption (Christensen & Knezek, 1999) describe how educators naturally progress through phases when integrating technology into their practice.

The Three Implementation Levels

These insights translate into three distinct implementation levels that run through every dimension of the toolkit:

Essential Implementation represents the foundational elements that any educator can implement with minimal resources and preparation. This level focuses on getting the basics right — ensuring all students can see, hear, and participate regardless of location. At this level, technology serves as a direct substitute for traditional methods, perhaps with some functional improvement.

Enhanced Implementation involves more sophisticated integration, requiring moderate redesign and intentional planning. At this level, educators are not just making hybrid teaching work; they're beginning to leverage its unique affordances. This represents technology enabling significant task redesign.

Transformative Implementation represents advanced approaches that fully realize hybrid learning's potential, often enabling entirely new forms of learning that wouldn't be possible in single-mode environments. This achieves what SAMR terms Redefinition — creating entirely new learning experiences that were previously inconceivable.

Studies by Griffin et al. (2022) and Fabian et al. (2024) reveal that institutions vary dramatically in their readiness for hybrid learning based on existing infrastructure, faculty expertise, and support systems.

Research on faculty development trajectories by Handayani and Sulastri (2022) documented that educators developing hybrid teaching skills progress through identifiable stages, each requiring different types of support. The implementation levels accommodate this developmental trajectory, providing appropriate scaffolding at each phase.

6. Detailed Dimension Descriptions

Dimension 1: Learning Environment & Technology Design

Overview The Learning Environment & Technology Design dimension focuses on creating integrated learning spaces that seamlessly connect what Bülow (2022) identifies as the "triple presence" of hybrid learning: physical classroom environments, digital environments, and remote students' contexts. Using the Activity-Centered Analysis and Design (ACAD) framework (Goodyear, Carvalho, & Yeoman, 2021), it encompasses both the tangible elements (hardware, classroom setup) and digital components (platforms, tools) while assuming learner variability from the start.

Key Elements **Triple Presence Integration** - Creating learning environments that acknowledge and integrate all three presence spaces as equally important. This includes optimized camera placement, display configurations, and design choices that honor the variability in remote learning contexts. Research by Bülow (2022) emphasizes designing for simultaneous presence across all three contexts rather than privileging the physical classroom.

Technology Selection & Configuration - Choosing appropriate technological tools that support specific pedagogical needs while ensuring compatibility and ease of use. Post-pandemic research highlights the critical importance of high-quality audio solutions as the foundation of effective hybrid environments (Raes et al., 2020; Wagner et al., 2023).

Visibility & Presence - Ensuring all participants can see, hear, and be seen/heard regardless of location through thoughtful configuration strategies. Recent studies emphasize creating equitable "presence" for remote students through visible representation in the physical space (Bower et al., 2015; Kee et al., 2023).

Technical Support & Contingency - Developing robust support structures and backup plans to address technical issues promptly. The pandemic experience reinforced the critical importance of technical resilience planning (Fabian et al., 2024). Cain (2015) and Zydney et al. (2019) emphasize the value of designated technology support personnel during hybrid sessions.

Accessibility & Equity - Creating environments that provide equitable access regardless of location, technical limitations, or individual needs. Post-pandemic research highlighted the importance of considering variability in student technology access, internet bandwidth, and home learning environments (Poskitt et al., 2021).

Tools and Components **Hybrid Learning Space Mapping Canvas** - A structured visual design tool that guides educators through creating spaces supporting equitable participation. Includes activity zone mapping, triple presence analysis matrix, and gap identification prompts.

Hybrid Teaching: Quick Fixes - In-the-moment support guide, including 60-second readiness checks, critical response flowcharts, and rapid activity pivots using universal design principles.

Dimension 2: Learning Experience & Assessment Design

Overview The Learning Experience & Assessment Design dimension addresses the pedagogical aspects of hybrid learning, embracing constructive alignment principles by integrating learning outcomes, teaching methods, and assessment as an interconnected system specifically adapted for hybrid contexts. Research shows that successful hybrid learning requires deliberate redesign rather than simply adding technology to existing practices (Beatty, 2007; Lakhal et al., 2017).

Key Elements **Course Structure & Content** - Redesigning course elements to leverage the strengths of both modalities. Post-pandemic research emphasizes intentional design that reimagines learning experiences for hybrid contexts (Raes et al., 2020; Fabian et al., 2024).

Cognitive Engagement Progression - Structuring learning through systematic modulation of different modes, from Receiving (passive engagement) to Responding (active engagement) to Creating (constructive engagement). This operationalization of Chi and Wylie's (2014) ICAP framework provides practical categories for organizing learning activities.

Constructive Alignment in Hybrid Contexts - Ensuring coherent relationships between learning outcomes, teaching methods, and assessment strategies across all participation modes. In hybrid environments, constructive alignment (Biggs, 1996) requires careful consideration of how each element functions differently in physical and virtual spaces. Learning outcomes must be achievable regardless of attendance mode, teaching activities must engage students equitably across modalities, and assessment tasks must validly measure the same competencies whether completed on-site or remotely. This alignment becomes more complex when activities designed for one modality must be adapted for another, requiring educators to maintain the essential learning purpose while adjusting the form of engagement. Research emphasizes that misalignment in any element—outcomes that favor one modality, activities that exclude remote participants, or assessments that advantage on-site students—undermines the coherence of the entire learning experience (Handayani & Sulastri, 2022).

Flexible Pathways - Designing experiences offering appropriate flexibility while maintaining clear structure. Post-pandemic research shows students value flexibility but benefit from structured approaches (Fabian et al., 2024).

Tools and Components **Learning Experience Design Kit** includes:

Activity Sequence Canvas - Large-format planning template structured around cognitive engagement progression with learning goals alignment, modality adaptations, and assessment integration.

Activity Design Across Spaces: Canvas Companion - Quick reference with prompts and suggestions for hybrid activity adaptation.

Activity Strategy Cards - Collection of diverse learning activites organized by cognitive engagement levels (Receiving/Responding/Creating) and types.

Assessment Method Cards - Strategies classified by purpose (Feedback & Dialogue, Evidemce & Documentation) supporting both formative and summative approaches across modalities.

Dimension 3: Facilitation, Equity & Community Design

Overview The Facilitation, Equity & Community Design dimension addresses the social and emotional aspects of learning that are particularly challenging in hybrid contexts. Research indicates that remote students often feel "ambiguity" regarding group membership (Olt, 2018; Romero-hall & Vicentini, 2017) and may experience different levels of engagement than on-site peers (Raes et al., 2020; Wagner et al., 2023).

Key Elements **Teaching Presence & Facilitation** - Employing specific techniques ensuring remote students have equivalent opportunities to participate.

Attention Management - Implementing strategies to manage increased cognitive demands including structured approaches and support roles.

Equitable Participation - Using specific techniques to ensure all students actively contribute including digital backchannel usage and balanced participation protocols addressing documented engagement disparities.

Community Building - Creating opportunities for meaningful connection through relationship development activities and intentional maintenance strategies addressing continuing challenges.

Cross-Modal Interaction - Facilitating meaningful student-to-student interaction bridging physical and virtual spaces through carefully designed collaborative experiences.

Belonging & Inclusion - Addressing group membership challenges through explicit inclusion strategies recognizing all participation modes as equally valued.

Tools and Components Here's the rewritten Tools and Components section for Dimension 3:

Tools and Components Facilitation Strategy Cards - A collection of facilitation techniques organized into five color-coded categories. Each card provides specific implementation guidance for managing simultaneous on-site and remote learners, addressing common challenges such as balancing attention across modalities, ensuring equitable participation opportunities, and creating seamless transitions between activities. The cards draw on attention management research and studies documenting the critical role of facilitation in hybrid engagement.

Community Building Cards - A collection of structured activity cards categorized by type (Introductions, Collaborative, Social Learning, Reflection, and Informal Connection) and include quick activities for energy management. Based on research showing that social connectedness directly impacts learning outcomes, these activities create unified community identity across physical and virtual participation modes, addressing the documented challenge of students feeling like "peripheral participants.

Making Hybrid Work for Everyone - A set of recomendations and checks for creating equitable hybrid learning experiences that assume learner variability from the start. Addresses common barriers across visual, auditory, and participation dimensions with proactive solutions, flexible activity designs, and support strategies. Drawing on Universal Design for Learning principles and accessibility research, this guide provides quick fixes for immediate implementation while building toward inclusive practice. Treats "disruptions" as opportunities for inclusive teaching rather than problems to fix, ensuring equitable participation for all learners regardless of location or abilities.

7. Conclusion: A Toolkit for Sustainable Hybrid Teaching

As hybrid learning evolves from pandemic necessity to permanent educational modality, questions of long-term sustainability have become paramount. Creating sustainable hybrid teaching models that prevent burnout while maintaining educational quality requires the kind of structured support this toolkit provides (Raes et al., 2023). The modular approach reflects how educators actually work —sometimes needing a quick solution for tomorrow's class, other times planning entire course redesigns.

This toolkit acknowledges that lasting transformation in education happens not through mandated revolution but through supported evolution. By providing curated tools — from planning canvases to strategy cards, from resilience guides to digital generators — it offers educators the resources they need to create engaging, equitable, and effective hybrid learning experiences.

Note: To support the literature review process, a combination of AI tools and traditional search methods was employed. Initial literature identification was conducted using Elicit and SciSpace, supplemented by manual searches to ensure comprehensive coverage. For summarization and thematic clustering Claude Opus 4.0 was utilized in a human-in-the-loop workflow. All outputs from AI tools were manually reviewed, adjusted, integrated to ensure accuracy and cross-verification of potential hallucinations or inconsistencies.

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Note: This reference list includes sources cited throughout the Hybrid Learning Design Toolkit. Not all references necessarily appear in this specific document.

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