

Introduction



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Into the Hybrid

Recall your favorite sci-fi books or movies. Most of these are very imaginative when it comes to transportation (hoverboards, teleportation and time traveling DeLorean), weapons and even sexual recreation (see Woody Allan's *Sleeper*). However, when it comes to education – almost always students physically congregate in a dedicated space, where they are taught to by a master, even if that master is an alien or AI.

Now, compare this image with present day reality. We have all witnessed situations where some or all of the students are at home, in a cafe, on the beach or in the woods – while others are participating in the same experience from a classroom. Even the teachers may be anywhere. As we allow technology to intermix our physical spaces – inadvertently it intermixes our social circles. No college student would ever think of bringing their mother to school, and yet we are no

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longer surprised when a family member, friend or pet enters the frame in a video session.

The blurring of boundaries goes beyond physical and social spaces. High school students are taking university MOOCs, alongside university graduates who want to upskill themselves without re-enrolling in a formal degree program. Students in formal academic programs will fill gaps in their department's curriculum through online courses from other universities, congregating in study groups that bring together local and remote peers alongside "informal" learners. They will conduct independent research in remote laboratories and collaborate in hackathons and competitions.

Such rich and complex technology-mediated modalities of learning, formal, informal and non-formal; individual and collaborative; face-to-face and online, have been growing intensively during the last decade, and have become part of everyday life for young students or lifelong learners. Their common element refers to the hybridity of different dimensions of learning.

Fast forward or back in time, we reach the Covid19 pandemic, raising hybridity into our educational circumstance in multiple ways, and bringing the topic of this book from the fringes to the mainstream. Yet our work on this topic did not start in the Covid19 lockdown. In 2016, some of us were involved in [EduPLoP.dk](#), a design patterns workshop focused on hybrid pedagogy. In 2019, we organised a [workshop on Hybrid Learning Spaces](#) at the European Conference on Technology Enhanced Learning (EC-TEL 2019) in Delft. This one-day workshop that explored hybridity in content and in practice brought together 35 participants from across Europe. It continued with a collation of papers contributed to BJET special section on HLS, published in the July 2020 issue ([Volume 51, Issue 4](#)). Another small step consisted in a small hybrid conference carried on in February 2020 across three geographical locations in Israel with a live contribution from Denmark.

This book offers a broad approach to Hybrid Learning Spaces, a term that has recently moved from the periphery to the center of educational practice. It adopts an interdisciplinary perspective, which combines pedagogy, technology and space design (including both physical and virtual space). The transversal inquiry-oriented approach looks at considering and connecting values, theory, design and practice. The book brings together different takes on hybridity from leading researchers and practitioners and thus presents the reader with new insights of how hybridity unfolds in different permeating planes – formal-informal, digital-analogue, online-f2f etc. We interleave voices from the learning sciences, architectural pedagogy, anthropology etc. Looking at the way hybridity manifests not only in one dimension. This book is unique in bringing together these diverse perspectives which do not often intermix.

What Do We Mean by Hybrid Learning Spaces?

The term hybrid originates in biology, where it denotes offspring resulting from combining the qualities of two organisms of different breeds, varieties, species or genera. In education, this term (often confused with blended learning) refers to arrangements which intermix distinct modes of learning and teaching. This notion, which seemed radical or esoteric not long ago, has now come to dominate our lives. Due to lockdowns imposed by Covid19, we all interleave our work and our family lives, our leisure and our teaching and learning. As Cohen et al. (2020) phrase it, “our life has been hybridized. We share co-working spaces with our families, we bring our classes into our homes, and ourselves into our students’ homes”. All aspects of our life seem to coexist in the same space and time, while technology enables (or forces) us to interact with peers in other spaces and times.

The notion of hybridity goes far beyond the concept of blending. While the former considers the introduction of digital elements into non-digital learning contexts (and more recently – the combination of synchronous and asynchronous modes of interaction), hybrid learning explores openly broader facets of learning coexistence. Hybridity can relate to learning with/without technology (e.g., Trentin, 2016), formal/informal learning, structured/unstructured, physical/digital artefacts and spaces (e.g., Ellis & Goodyear, 2016), teacher-student role interplay (Bennett et al., 2020) etc. Thus hybridity represents a more complex theoretical and practical construct and has duality of coexistence or even goes onto the merging of them (Eyal & Gil, this issue).

This book presents different facets of hybridity that come into play in various studies. It points to the potential those understandings yield to the present and future of K-12, higher education, or lifelong learning.

The Structure of the Book and Chapters Outline

The book is organized along three axes: Pedagogy, Technology and Space Design. Some contributions focus on a specific range in this spectrum, others traverse and connect between its parts. They span theoretical analyses, reviews, case studies and examples and design frameworks (e.g., principles and patterns). Table 1 maps the chapters according to the main axis (columns). Some chapters relate to more than one axis – thus we have added a colour to indicate primary and secondary focus, (Grey = General, Green = Pedagogy, Blue = Technology, Pink = Space design).

The book starts and ends with chapters that correspond to the general outlook of HLS (Chapters “[Hybrid Learning Spaces – A Three-fold Evolving Perspective](#)”, “[Hyper-Hybrid Learning Spaces in Higher Education](#)”, and “[Forward Looking: Predictions for the Future of Hybrid Learning Spaces](#)”). Eyal & Gil (Chapter “[Hybrid Learning Spaces – A Three-fold Evolving Perspective](#)”) consider the semantics of hybrid learning, and the tensions between the different interpretations

Table 1 The book chapters according to the PTS axes

Pedagogy	Technology	Space Design
■ ■ Eyal & Gil Chapter 2	■ Pishtari & Rodríguez-Triana Chapter 10	■ ■ Kune & Quillien Chapter 12
■ ■ Nørgård & Hilli Chapter 3	■ ■ ■ Martinez-Maldonado et al. Chapter 11	■ Mor-Avi & Scott-Webber Chapter 13
■ ■ Bøjer & Brøns Chapter 4		■ ■ Kohls, Dubbert & Münster Chapter 14
■ ■ ■ Fawns et al. Chapter 5		■ ■ Simpson & Goodyear Chapter 15
■ Cook & Holley Chapter 6		■ Warburton & Perry Chapter 16
■ Velamazán, Santos & Hernández-Leo Chapter 7		■ ■ Mor et al. Chapter 17
■ Wong & Looi Chapter 8		
■ Bülow Chapter 9		
■ ■ Mor et al. Chapter 17		

Legend: ■ General, ■ Pedagogy, ■ Technology, ■ Space design

of this term. On one end of this spectrum, we find hybrid as a synonym for blended learning, emphasizing the intermix of physical and virtual spaces in the context of rigid conservative educational structures. On the other end, we see unbounded multi-dimensional fluidity, allowing learners (and teachers) to move freely between physical, social and organizational spaces – while maintaining their connection with a shared educational endeavor.

Toft, Nørgård & Hilli (Chapter “[Hyper-Hybrid Learning Spaces in Higher Education](#)”) coin the terms *Hyper-hybridity* and *Hyper-hybrid learning spaces* to highlight the emergence of new educational contexts, characterized by multiple dimensions of hybridity. Such contexts, or spaces, blur the boundaries between online and onsite, synchronous and asynchronous, but consequently and more importantly – the boundaries between formal and informal education, academic and work-based, and eventually between learners and teachers. Such contexts create powerful surprising opportunities for learning, but their complexity raises the risk for confusion and frustration. Thus, the design of learning activities needs to provide clear support points and enable constant re-negotiation of the space and the activities within it.

Part I focuses on **innovative pedagogies** of HLS. Bøjer & Brøns (Chapter “[How Co-design Can Contribute to the Ongoing Development of Hybrid Learning Spaces by Empowering the Users](#)”) demonstrate how pedagogical and epistemic practices are intertwined and interdependent with space and technology. Engaging teachers and learners in a scaffolded process of co-design of educational spaces opens up possibilities for reflection, meta-epistemic discourse and self-determined learning, while creating unique opportunities for teachers’ professional development. Such a process is in itself a hybridisation of the educational structure, blurring the boundaries between teacher and learner.

In Chapter “[H2m Pedagogy: Designing for Hybrid Learning in Medical Education](#)”, Fawns, Markauskaite, Carvalho & Goodyear report on an adaptation of the ACAD (Activity-Centered Analysis and Design framework) framework to offer academic staff a professional development course called “Agile Course Design for Professional Education”. This course scaffolded participants in a process of reflecting on and designing for professional education in the age of COVID19. The limitations of social distancing triggered a renewed focus on learner agency and flexibility, and an inspection of the efficacy of educational practices. Thus, necessity and external challenges can drive innovations which will have value long after the current crisis is behind us.

Three cases transforming into online/hybrid learning in the time of Covid19 are presented in Cook and Holley’ Chapter “[Covid-19 Lock-Down: Hybrid Learning Cases Using the Lens of the Zone of Possibility](#)”, set within a framework of Zone of Possibility (ZoP). The authors inquired how the design process can advance or bridge effective communication and an understanding of social context in a ZoP. Their findings identify critical factors: contextual framing, pedagogic implications and implications for design for case study analysis. An emergent meta-design principle is implied for future design, acquiring the name ‘Respect Learners’ Zone of Possibility’.

Velamazán, Santos and Hernández-Leo (Chapter “[Socio-emotional Regulation in Collaborative Hybrid Learning Spaces of Formal–Informal Learning](#)”) highlight the issue of socio-emotional regulation in the context of formal and informal hybrid learning context. With study data collected from students’ activity within the content area of Mathematics they offer to further investigate and design ways to support students in improving their socio-emotional regulatory skills through hybrid learning contexts.

Wong and Looi (Chapter “[Seamless Hybrid Science Learning: Streamlining the Techno-Pedagogical Designs for Wider Diffusion](#)”) present and evaluate in a two-year study a set of pedagogical design principles known as C2FIP (Connectivity, socio-Constructivist learning, Formative assessment, leveraging resources in Informal settings, Personalized learning) for hybrid seamless learning. Their qualitative descriptive study in real-world contexts allows an assessment of the proposed design principles and points to a complex landscape of hybrid science learning. Adoption of the design principles may require a deep enculturation process across multiple stakeholders (teachers, learners, curriculum and instructional designers, etc.), since such principles involve an integrated view of some important dimensions of hybrid learning such as individual/collaborative/classroom, formal/informal, formative/evaluative, personalized and inquiry.

Bülow (Chapter “[Designing Synchronous Hybrid Learning Spaces: Challenges and Opportunities](#)”) looks at synchronous hybrid teaching, a specific case of hybrid learning, when students in different locations, including the physical class, engage in learning in a shared learning space. Looking through the ACAD framework, he synthesizes insights from a review of 47 recent papers. The chapter unfolds the challenges and opportunities pertaining to the design of learning that many institutions adopted, due to pandemic, but apparently was in use beforehand.

From this review, he formulated guidelines for supporting activity-centered learning design for learning in a post-pandemic future.

Part II puts more emphasis on **technological issues** underlying hybrid learning spaces. Pishtari and Rodríguez-Triana (Chapter “[An Analysis of Mobile Learning Tools in Terms of Pedagogical Affordances and Support to the Learning Activity Life Cycle](#)”) deal with the relevant domain of mobile and ubiquitous learning. Most specifically, the chapter considers both pedagogical and orchestration affordances for the m-learning tools that have been analyzed. The authors propose a new framework, OA-LALC, which provides a very interesting view of the orchestration affordances for both Learning Analytics (LA) and Learning Design (LD) viewpoints in the different phases of the learning activity life cycle. It is expected that the framework can guide researchers in further studying an integrated view of LA and LD in current and upcoming hybrid learning environments. Finally, the chapter provides insights on the issues that arise when different spaces (digital and physical), learning settings (formal and informal) or contexts (indoors and outdoors, in-classroom and out-of-classroom) are considered in a hybrid learning context.

Martínez-Maldonado and colleagues (Chapter “[Classroom Analytics: Telling Stories About Learning Spaces Using Sensor Data](#)”) present and discuss three data stories in which data traces are collected through sensors from classroom activities and meaningful classroom analytics are generated. Position and proximity sensors provide useful multimodal classroom proxemic analytics that may contribute to assessing pedagogical activity; informing the eventual re-configuration of the learning space; providing digital traces and analytics to students and teachers; and speeding up research cycles that currently depend only on observations. Researchers in hybrid learning spaces may build on the concept of classroom analytics and eventually bridge these classroom digital traces with those occurring in online or out-of-class spaces.

Part III emphasizes the **spatial design** of HLS. Kune and Quillien (Chapter “[Co-creating Futures Through Virtual ‘BAs’](#)”) take an interesting viewpoint for the hybridization of innovative processes common in education. They explore the Japanese concepts of BA, MA, WA, and KATA and how these foster co-creational collaborational activities. The authors discuss the interpretation of these concepts and their manifestations in online environments, clearly showing the shortcomings and challenges of current virtual technologies. Using the concepts for adapting the processes and technologies requires a more hybrid approach, the suggested design constraints and the personal reflections and thought experiments help the reader to concretize the ideas of this essay.

Mor-Avi and Scott-Webber (Chapter “[Creativity Flourishes Using Hybrid Space Patterns](#)”) look closer at the impact of architectural solutions in educational settings which stimulate creative and collaborative processes. Based on conducted research, the authors identify several dimensions supporting creativity and learning which seem contradictory when interpreted as dichotomies. Applying the hybrid approach offers opportunities for intermingling these dimensions and in consequence allowing flexible space design which is adaptive to learners’ needs. The resulting types

of design patterns provide good guidelines for designers and architects of adaptive learning spaces.

The focus of Chapter “[Patterns for a Hybrid Campus](#)” by Kohls, Dubbert & Münster are good practices for creating hybrid learning spaces at university campuses. The authors start with the identification of hybrid space dimensions based on the ideas of hybrid pedagogy, blended learning, and seamless learning. These dimensions are explored with fictional design examples, followed by a presentation of their realization in a concrete case study. The authors use design patterns as a way to generalize their experiences and observations, the paper concludes with a specific pattern which can be applied by other designers of hybrid learning spaces.

Simpson and Goodyear (Chapter “[Dialogic Teaching and the Architecture of Hybrid Learning Spaces: Alexander Meets Alexander](#)”) take the idea of dialogic teaching (by Robin Alexander) and describe its applicability in hybrid learning spaces. They provide two extensive examples of how the dialogic approach was reconfigured to match the move to hybrid learning in a mainly online environment. Descriptions of concrete implementations such as the use of traveling artefacts, the extension of the classroom space, or space transitions in online environments are complemented with a more architectural view on learning space design as also discussed in the work of architect Christopher Alexander.

Warburton and Perry (Chapter “[Design for Balance: Addressing Challenges of Safety, Privacy and Identity Management in Online and Hybridised Learning and Teaching Spaces](#)”) bring together several related important concepts that characterize hybrid learning spaces, such as privacy, safety and identity, through a joint model and five design patterns. They contribute with emerging ideas towards hybridized learning, with a strong focus on recent experiences with the Covid-19 pandemic and social networks. Most interestingly, the authors suggest the use of place as the term to replace space, as “it allows learning designers to access relational, emotional and comparative thinking in their designs”, since “place is authentic and always socially constructed, in other words somewhere that is emotionally and personally significant”.

We conclude with the *Forward Looking* chapter (“[Forward Looking: Predictions for the Future of Hybrid Learning Spaces](#)”) by Mor, Gil, Dimitriadis & Köppe that synthesizes insights from all chapters and distills some predictions for the HLS close and distant future. These predictions underwent a “quasi-Delphi” study to acquire validation and refinement, the results of which are laid out for current special interest and future research. Two predictions stand out: first, Hybridity has become the standard in post-COVID19 educational systems, but in the narrow sense of blended / HyFlex (dual mode, hybrid synchronous instruction) classrooms. The normalization of hybridity will open the door to more innovative forms – where dichotomies of formal-informal, academic-work etc. are blurred. While these more radical interpretations of hybridity (or hyper-hybridity) will never become mainstream, they will nonetheless become more common and the place for students’ motivation might play a more central place in the learning process. Second, Hybridity also includes a shift from passive to active learners, which necessitates a fresh view on the design of the physical and virtual spaces – which will need to afford flexibility and empower

learners and teachers to shape their learning context, and engage, in the words of Donald Schön, in a constant conversation with the materials of their environment. These are just two out of the 11 predictions we uncovered. These garnered the highest level of consensus. But we found the most disputed ones just as interesting, for they signify that this is a dynamic field, where the community is still exploring the boundaries of possibility and the governing rules of interaction.

Summary and Vision

In 1977, Christopher Alexander and his colleagues published their seminal book “A Pattern Language: Towns, Buildings, Construction”, among the design patterns they advocate are “network of learning”, “university as marketplace” and “shopfront schools”. All three reflect a vision of hybrid learning spaces. Indeed, many of the ideas that we present in this book can be traced back decades and even centuries. Yet educational institutions, like many large institutional systems, are notoriously resistant to change.

Recent years have brought about the unprecedented combination of acute needs and technological availability, which have created the opportunity for these ideas to manifest themselves. As the world recoils from the pandemic, some of the emerging practices will be undone, some teachers and students will go back to their old habits and experiences. Others will maintain the new practices that have proven effective, and others still will combine old and new and seek new ways to improve both.

Our work on hybrid pedagogy and hybrid learning spaces started in 2016 with the 2nd EduPLoP workshop. The world has changed a lot since, and we see many of the results of this workshop applied in various educational fields. But in the last years – and especially during the pandemic – it also became clear that we still just have opened the door to this perspective in educational design which might, and hopefully will, have a larger impact on future education. It is time for some change, it is time for hybrid learning spaces.

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