Hybrid learning spaces -- Design, data, didactics

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Project   WebLabs View project

Project   Hybrid Learning Spaces - Design, Data, Didactics- Spacial issue BJET View project

Hybrid learning spaces—Design, data, didactics

This special section is published at a pivotal time. Over the last months, COVID-19 has changed so many lives in so many ways. Obviously, we are not qualified to consider the broader implications of the current events. But in terms of educational technology, we are witnessing a seismic shift. All over the world, in a matter of days, hybrid education has moved from an esoteric notion to the de-facto norm. In fact, we find ourselves in a situation where major parts of our lives have been hybridized. We share co-working spaces with our families, we bring our classes into our homes and ourselves into our students' homes. Within a week, the term "blended learning" has shifted from referring to a mix of on-site and on-line to signifying the combination of synchronous and a-synchronous online learning. Yet, there is a subtle and critical difference between the concept of "blended" and that of "hybrid." Blending is defined by the Merriam-Webster dictionary as "to mix, to combine or associate so that the separate constituents or the line of demarcation cannot be distinguished." However, in education blended configurations typically interleave modes or modalities of instruction, without disrupting or blurring the different constituents. Hybridity is a more complex phenomenon. As Hilli, Nørgård, and Aaen (2019) note, the term hybridity (which originates from Latin) is borrowed from biology where it refers to cross-fertilization or the fusion of separate parts or species into a new one. A hybrid is not a meshing of two constituents, it is the two distinctively at once and this duality is what creates something new. Consider a teacher and a student engaged in a class through a video-conference, when they are both in their respective homes. The teacher is simultaneously "at home" and "in class," as is the student. But the teacher also has to acknowledge the students "home" space, simultaneously with the "class" space and her or his own "home" space. At the moment, this is a challenge for both. Can we also turn this into an asset?

The discourse of disruption and innovation in education is wide and varied (eg, Canals, Burkle, & Nørgård, 2018; Nørgård, Mor, & Bengtsen, 2019). The focus on hybridity highlights the challenges and opportunities which transpire from the blurring of boundaries between contexts of learning, working, playing and living and the unexpected experiences and hybrids that emerge. Boundaries between on-line and off-line, on-site and off-site, synchronous and a-synchronous, formal and informal, vocational and recreational and more. Arguably, hybrid learning spaces drive a change that goes beyond the locus of learning. A hybrid pedagogy fundamentally rethinks our *conception of place*. Hybridity is multidimensional: it concerns the interleaving of formal and informal social structures of learning, the combination of physical and digital tools mediating individual's interaction with the world and society, and more.

The spaces we teach and learn in are changing. Technology is permeating physical spaces, augmenting and enhancing learning experiences. At the same time, mobile and pervasive internet-connected technology (IoT) creates interfaces between virtual spaces and real-world phenomena in which big data are collected. These dynamics give rise to a growing presence of hybridity: the blurring of boundaries between distinct contexts of learning and activity, and the unexpected interleaved experiences they engender (Cohen & Ezra, 2018; Ellis & Goodyear, 2016; Trentin, 2016).

Hybridity is not a technical or technological issue. As Stommel (2012) notes: "The word 'hybrid' has deeper resonances, suggesting not just that the place of learning is changed but that a hybrid pedagogy fundamentally rethinks our *conception of place*." Cook *et al.* (2015) identify two dimensions of hybridity: the interleaving of formal and informal social structures in an activity system, and the combination of physical and digital tools mediating individual's interaction with the world and society. They argue: "people connect and interact through a hybrid network of physical and technology-mediated encounters to co-construct knowledge and effectively engage in positioning practices necessary for their work" (Cook *et al.*, 2015, p. 125). In this way, the very notion of what education signifies and how it is experienced and enacted might also change through becoming hybridized.

Consequently, hybrid learning spaces open opportunities and pose challenges to designers of learning experiences. Apart from the complexity of combining multiple modalities to achieve effective synergies, these spaces have a novel quality: activities within them generate data, which can be used to monitor individual and social learning processes, and potentially feed back into them, to enable "double loop learning": awareness and control the process of learning and teaching itself (Blaschke, 2012). Recent years have witnessed a growing interest in the promise of educational data science (EDS), a term coalescing learning analytics (Ferguson, 2012), artificial intelligence and educational data mining (Cohen, 2017; du Boulay, Poulovassilis, Holmes, & Mavrikis, 2018; Levi-Gamlieli, Cohen, & Nachmias, 2015; Lim, 2016). In particular, there is an emerging recognition of the valuable intersection between data and educational design (Hernández-Leo, Rodriguez Triana, Inventado, & Mor, 2017; Mor, Ferguson, & Wasson, 2015; Toetenel & Rienties, 2016). While the tradition of EDS originated in the study of virtual learning environments, recently we see first advances into its use in physical environments (Cukurova, Luckin, Millán, Mavrikis, & Spikol, 2017; Prieto, Sharma, Kidzinski, Rodríguez-Triana, & Dillenbourg, 2018). However, although the correlation between physical space design and educational effect is well established (Tanner, 2000), Learning space research is a relatively new field of study that seeks to inform the design, evaluation and management of learning spaces (Ellis & Goodyear, 2016) and EDS has not yet ventured into this domain.

Education systems are beginning to recognize the potential of hybrid learning spaces in promoting significant learning, and increasingly use pedagogical hybrid learning models. Recent work has begun exploring the nature of hybridity from an educational design perspective. The papers in this special issue explore these themes from diverse perspectives.

Two contributions make bold attempts to formulate a design language for hybrid learning spaces. Goodyear (2020) draws on analyses of real-world design practice to advance and illustrate an argument for higher level, more abstract, descriptions of how such work is done and how design lessons learned might be more easily shared. His paper prompts some rethinking of how design for hybrid learning occurs, what it consists of and how it may be improved. Eyal and Gil (2020) propose a set of design patterns for teaching in academic settings in future learning spaces. The patterns involve hybridity, including both formal and informal social structures and a combination of physical and digital tools mediating individuals' interactions with peers. They extracted four design patterns which can be used as learning design scaffolds in a social constructivist approach in which pedagogy, technology and space interact.

Pishtari *et al.* (2020) compliment the view on learning design with a review of learning analytics and the interrelations between them, in the context of mobile and ubiquitous learning. They highlight the potential of emerging tools, frameworks and methods to enhance our practices of teaching and learning in hybrid spaces.

Three papers present pedagogical designs exemplifying how students build shared knowledge objects iteratively. Kauppi, Muukkonen, Suorsa, and Takala (2020) present a design-based research, in which they studied the benefits and challenges in reaching the expected learning outcomes of an e-course. The practical purpose was developing the pedagogical design of this e-course. The scientific objective was to build on the research about design principles that guide teachers in constructing e-courses, enabling in-depth learning in hybrid learning spaces. Hod and Katz (2020) emphasize the need to design activities to support both sociocognitive and socioemotional spaces in technology-enhanced learning communities using a novel methodological approach to examine the co-development of socioemotional and sociocognitive spaces through a group developmental framework and chain analysis. Yang, Chen, Yu, Feng, and van Aalst (2020) examine the facilitation of shared epistemic agency through a knowledge-building (KB) design that included analytics-supported collective reflective assessment (AsCRA). They show the importance of the creation of a collaborative–metacognitive culture for Knowledge building inquiry, showing that this culture can be enabled by fostering a sense of community and by helping students deploy and develop metacognitive skills such as reflection and planning.

Cook, Mor, and Santos (2020) add the concepts of Zone of Possibility (ZoP) and Bridging Practices to the discussion of the epistemic practices of learners in hybrid spaces. These concepts are illustrated, elaborated and refined through the analysis of three case studies of design-based research initiatives.

Wu, Kim, and Markauskaite (2020) and Bennett, Knight, and Rowley (2020) demonstrate two interesting examples practices. The first deals with principles for a hybrid design of empathy games for developing young children's empathic perception through digitally mediated interpersonal experience. The authors present theory-informed design principles for creating tablet games with a focus on promoting empathic perception—a building block for the ability to see, sense and understand other's internal states. Dawn Bennett *et al.* shows us the role of hybrid learning spaces in enhancing higher education students' employability. Their paper discusses a design-centric approach to employability development which was enacted within a hybrid learning space.

Xiao *et al.* (2020) add a practical model for practitioners to realize a hybrid learning space that has a high level of flexibility in terms of time, space and pace of learning. They showed that cognitive engagement competence was significantly associated with hybrid learners' satisfaction and experience. Their findings indicated that since hybrid learning keeps all options available, to experience satisfying learning, students need not have certain competences but cognitive engagement competence, which is correlated to learners' cognitive ability to figure out the right mix of learning options.

Veldkamp *et al.* (2020) present a unique concept in the field of escape rooms through their developed box. They explore the adaptation of the escape room concept into educational escape game boxes showing that the design of the box with assignments on each side puts users face to face with each other and requires them to collaborate in the physical world, instead of being individually absorbed in a digital world. Consequently, this technology-enhanced escape boxes have become hybrid learning space, merging individual and collaborative learning, as well as physical and digital spaces.

Along with the opportunities that arise from the presented paper in this special section, there are issues that require further exploration and in-depth discussion among the community of researchers, developers and practitioners in the field of hybrid learning spaces. Issues such as:

- Ownership and empowerment: when we mix learning contexts, eg, a curricular course and a MOOC, who sets the learning objectives? Who is responsible for monitoring achievement?
- Representation and interpretation: How do we map the data we collect to complex learning dynamics? How do we avoid the "streetlight effect," of valuing what we can measure rather than measuring what we value? How do we derive insights from data, and present them in such a way that will assist learners, teachers and administrators?
- Ethics: what are the risks and consequences of collecting and manipulating data about learners and learning environments? How do we draw the line between assessment, evaluation and surveillance? What are the appropriate modes of behavior in hybrid learning spaces? Moreover, what is the purpose of education in hybrid learning spaces, where learners come from divergent backgrounds and with different aims?

Our work towards this special issue started almost a year ago. It began with a call for papers for a workshop at EC TEL in Delft. That workshop (https://hls-d3.iucc.ac.il/events/ectel19/) brought together 35 participants from across Europe and beyond for an intensive day exploring the (then) somewhat esoteric notion of hybridity. Our event itself was also hybrid: combining synchronous and a-synchronous interaction, on-site and off-site, on-line and off-line. Little could we imagine that by the time of the publication of this special issue, practically all education will have turned hybrid. The papers in this special issue explore these themes from theoretical, empirical and conceptual perspectives. Together, they contribute to a design discourse of hybrid learning spaces: design as a practical approach to shaping the future and design as a scientific paradigm, drawing on the traditions of educational design research and utilizing canonical design representations such as design principles and design patterns. We hope that this unique trans-disciplinary special section will bring together leading researchers and practitioners in this emerging field, to explore the promises and dilemmas it raises from ethical, methodological, ontological, epistemic, pedagogic and technological perspectives.

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