



Introduction

The Future of Futures Thinking in Design Education

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Abstract

This special issue stimulates the conversation between futures studies and design education. Discussions started at the International Conference on Design Futures in 2020 and continue today. Articles and essays in this issue examine future thinking in design education, present different approaches to teaching futures literacy, and discuss ways to advance futures literacy in design practice. Our objective is to transform design education to focus on long-term issues rather than just short-term ones, highlighting futures literacy in shaping design abilities to deal with uncertain futures.

Zhiyong Fu

Future thinking and futures literacy are key skills in design education for helping students understand, forecast, and shape uncertain futures. Future thinking is exploration and forecasting alternative futures and their impact on current decisions and actions. Inayatullah describes futures thinking as exploring possible, probable, and preferred futures by mapping patterns, anticipating emerging issues, deepening analysis through causal layered analysis, and creating alternative pathways to help people recover their agency and create the futures they desire (Inayatullah 2008). Futures literacy is the capacity to explore the potential of the present to give rise to the future by developing and interpreting stories about possible, probable, and preferred futures, thereby improving the ability to make informed choices in the present without attempting to predict what will actually happen (Miller 2007).

Futures thinking as an educational method aims to extend students' thinking through systems thinking, scenario development, and backcasting, enabling them to consider long-term impacts and alternative possibilities. It cultivates their foresight abilities and preparedness for sustainability crises by fostering responsible agency, shared decision-making, and value-based transformation essential for taking action toward desirable futures (Laherto & Rasa, 2022). Futures thinking enables students to consider science and its social, cultural, and political environments, enabling them to contribute to societal transformation (Jones et al., 2012). Future-oriented activities can broaden students' future cognition, imagination of alternatives, and ability to navigate uncertainty (Carter & Smith, 2003). Socioscientific issues exemplify this approach, as they can stimulate student engagement, foster value-laden discourse, and promote analytical and critical thinking (Jones et al., 2012). In practice, design educators have envisioned four future scenarios for design and designers in society, including integrating design education into the K-12 curriculum, making design a core skill across interconnected global university networks, extending designers' influence into public and socioeconomic policy, and personalizing remote design education to individual learners' interests. This revealed core needs in design education and envisioned a framework for the future (Singh et al., 2018). Futures literacy, considered a meta-literacy, integrates language, digital/information, and scientific/critical literacies to enable elementary and secondary school learners think about the future in any topics or disciplines they study (Vidergor, 2023).

The growing adoption of futures thinking is transforming design education. By integrating futures thinking into design education, designers can be equipped with future-oriented knowledge to envision and leverage the future to drive design innovation and sustainable solutions. This represents a shift that emphasizes complexity, uncertainty

and change, indicating that design education is increasingly aware that students need to be able to think critically and creatively beyond technical competencies.

To systematically implement this transformative vision, organizations and scholars have provided valuable guidance. In the report “Reimagining our futures together: A new social contract for education”, UNESCO advocates educational reforms that education systems should be reformed to cultivate students' critical thinking, innovation, and global citizenship (UNESCO, 2021). The concept of Design Futures is closely related to this, as it explores and shapes possible futures through interdisciplinary learning and anticipatory design practices, providing new ideas and tools for solving global challenges (Candy & Dunagan, 2017). Design Futures goes beyond traditional problem-solving by nurturing future literacy and future-shaping capabilities that enhance students' foresight, adaptability, and innovation, empowering them to shape a sustainable, socially valuable future actively.

Design education requires integrating art, science, and technology to develop students' visual intelligence, ethical sensibility, and aesthetic intuition (Findeli, 2001). This framework balances knowledge, practice, and value guided by social and environmental responsibility. Future-oriented design education needs to synthesize vision, theories of change, mindset and posture, and new design methodologies, fostering transdisciplinary knowledge and systems thinking capabilities. (Irwin, 2015).

Through scenario planning, speculative design, and interdisciplinary learning, futures thinking has shifted design pedagogy from teaching skills to engaging uncertainty. This shift in teaching moves beyond transmitting established knowledge to helping students critically examine assumptions and actively construct alternative futures.

Anna Barbara

This Special Issue focuses on the need to systematically introduce Futures Studies into the education in design, architecture and urban studies. The Global Design Futures Network (GDFN) was established across three major universities, Tsinghua University, Politecnico di Milano and Carnegie Mellon, to ensure that the discipline of Futures Studies is considered to all intents and purposes a fundamental teaching in the education of designers. The network, which has seen numerous activities in its first four years, is becoming a reference for institutions that intend to experiment with Futures Studies in education, research and design. The area of Futures Studies, in fact, encompasses and crosses many disciplines and design practices, which are strategic for the conscious growth of a generation of designers, but also policymakers and entrepreneurs. Over the years, the topic has been the subject of international conferences involving futurists worldwide, seminars with institutions, and experiments with students, PhD candidates, scholars and researchers from various universities (Fu et al., 2020).

Designing a Futures Studies pedagogy requires a disciplinary strengthening and broadening, both in terms of the methods of Design Thinking and the point of observation, which remains extremely anthropocentric (Inayatullah et al., 2006). Starting from universities that so different in their history and cultural roots also means wanting to explore the future of Futures Studies, not only from Western perspectives, trying to involve institutions from other countries to include their visions, cultures, and traditions. The purpose of GDFN is to put different and alternative futures at the center by involving universities from very different and distant countries, to loosen the technological obsession, to decrease the emphasis on predictions, and to become multicultural and plural (Sardar, 1999). The challenge of the GDFN is to start literacy from the very beginning of education, so that the future is not seen as inescapable, but becomes a true design methodology for the next generation of students at every level of education (Bishop & Hines, 2012). The GDFN approach embodies the opposite form of paternalistic disciplinary education, as it enables students to regain autonomy and self-determination. The skills required must be both technical and cultural to enable awareness and language, but also the freedom that allows people to orient themselves, develop ideas and points of view, express themselves and defend their dignity (Miller, 2006). Indeed, the new generations historically see their future vanishing, cannibalized by previous generations. Teaching them through Futures Studies offers new pedagogical tools, but also calls for pro-action.

The associated educational objectives of Futures Studies aim to educate and assist students in developing the ability to see and prepare for their future, to interpret significant changes, whether technological, political or social (Poli, 2017). The introduction of common goals such as the SDGs helps to build shared actions, without neglecting the fact that the construction of shared methodologies and practices has a strategic nature on the generations that

those futures begin to design. The relationship with the future that one seeks to establish becomes more strategic than the future itself. It is no longer understood as a forecast, but as long-term thinking that helps project design thinking into the future to consider how the context, in its broadest sense, may evolve (Corà et al., 2023). In the context of teachings, especially related to design disciplines, the exercise of temporal projection is a fundamental axis on which to run the projection of visions. It becomes essential to teach where to place the various thresholds of futures; to identify what the concerns and expectations are; what scenarios of the future include the envisaged projects; what post-human perspectives are included; how many futures are reconcilable with the envisaged project.

From the perspective of educational practice, but also of scientific research, it emerges that we need to promote the next generation of architects and designers, so that they are capable not only of assessing issues from a design and community perspective, but also of designing the future they desire for themselves and for the communities in which they live. Indeed, what is needed is a process of redefining the reading categories of the current world on the dimension of the future, not as a possible near future scenario, but as an element of the social imaginary through which strategies of coexistence and development can be elaborated (Appadurai, 2014).

The educational objectives of a pedagogy for Futures Studies must allow for the development of desired scenarios that motivate and produce results; the exercise of anticipatory studies; the sharing of ethical values that help make appropriate choices among various possible alternatives; the understanding of trends and events that may influence the future, capable of exercising both creative imagination and critical thinking to discern a range of possible, preferable and desirable futures on a personal and collective level; the development of responsible citizenship and political skills to contribute to active and responsible citizen participation. All futures - possible, plausible, probable, and preferable - must have a voice in the project so that there is awareness of the mechanisms by which we can shape it (Amara, 1981).

The timing is particularly favorable because pedagogy as a whole is experimenting with digitally-related hybrid forms of education, which allow for greater experimentation and support of learning systems and help raise awareness of new perspectives (Slaughter, 1996). This Special Issue continues GDFN's exploration and collection of Futures Studies.

Peter Scupelli

This special issue explores how futures thinking and design thinking are mixed into design education. The mixing of futures and design is meant to be both provocative and exploratory in nature. We seek to show diversity in perspectives of how the global community sees that interdisciplinary space of encounter between futures in design education.

Historical precedents illustrate that new ideas often emerge at the intersection of differing ideas, disciplines, and cultures (Johansson, 2004). There is a rich history of how new design thinking methods emerged to address new areas of societal concern (Jones, 1992). Futures Studies as well continue to evolve and change over time to address new societal concerns (Gidley, 2017). It follows that the landscape of futures in design education will fluidly continue to evolve.

Historically speaking, periods of change can be challenging, confusing, and unclear. Change often challenges established paradigms by identifying edge cases that are not well supported by status quo paradigms (Kuhn & Hacking, 2012). We're observing an emergent paradigm shift in design education to address twenty-first century societal level design challenges such as the unfolding climate disaster and the SDGs (Davis & Dubberly, 2023).

The introduction of futures themed courses into design schools follows different trajectories such as: elective courses, required courses, and new focused areas of study. For example, I've noticed the appearance of elective courses such as, design fiction, speculative design, critical design, experiential futures, for both undergraduate and masters students. Next, I noticed the introduction of a required futures course for all undergraduate design students. In other institutions worldwide, masters degrees in Design Futures are offered (e.g., Royal College of Art, Royal Melbourne Institute of Technology). Likewise, certificate courses in design futures are taught as continuing education elsewhere (e.g., Parsons, IFTF, XuetaangX). This broad range of examples indicates that there are indeed many ways to combine futures into design education.

For this special issue, we gathered articles illustrating a broader range of ways of integrating design and futures

into design education. You'll notice some interventions operate at the philosophical level, others describe exercises, others focus on course design, a whole new curriculum design, or the role of conferences as knowledge flows and exchanges.

For example, Barbara and Ma focus on shifting the worldview around design futures to include community. Lundmark and Rodela situate hackathons as a mechanism for students to explore futuring in the educational context. Cooper embeds design futuring tools within a foundational visual communication course. Martin describes a futures pedagogical framework for sustainable transformation of design teaching and learning. Lin, Villari, Yan, and Wang explore speculative design and systems perspectives into service design teaching. Zhu, Chao, and Fu describe speculative design in HCI as a way to bridge to the design futures community. Barendregt, Bendor and Van Eekelen identify the meaning of criticality in design futures education. Lyu, Zhu, and Fu describe the International Conference of Design Futures as a distributed knowledge building and flows.

Summaries of articles, essays and reports

This special issue consists of nine articles, two essays, and one report focusing on the intersection of futures thinking and design education, adequately addressing the extensive scope of the topic in various design educational scenarios. Zhiyong Fu and Qing Xia propose *Design Foresight* as a unified approach that integrates two complementary methodologies: futurization, which explores a broad range of future possibilities to enrich scenarios, and de-futurization, which focuses on realizing preferable futures through concrete pathways. This framework balances speculative exploration with practical implementation, enabling designers to both imagine diverse futures and develop strategic approaches to achieve the most desirable ones.

Kirsten Bonde Srensen studies two groups facing uncertain life situations, and shows how reframing and imagining can be powerful life skills. Based on her life-centered design approach and supported by neuropsychological research, she shows how design activities can turn anxiety into positive resources, allowing individuals to envision alternative futures and to prepare, recover, and invent in response to change.

Rike Neuhoff, Luca Simeone, Andy Peruccon, and Lea Holst Laursen investigate experiments conducted within a Danish master's program in design futuring that explored designerly ways to welcome otherness, diverse views, needs, and ways of being. They show that our minds move between a habitual, self-centered state and one more open to otherness. They argue that design futuring education should cultivate mind-sharing with otherness, as these can challenge self-centeredness and associated notions of narrow-mindedness and short-termism.

Anna Barbara and Yuemei Ma trace the historical relationship between utopias and architecture, proposing that architecture education should shift from abstract utopian thinking to realizable futurescapes through futures literacy. Based on Yona Friedman's notion of 'realized utopias' and the 1970s radical architecture movements, they argue that futures literacy can empower the next generation of architects and designers to design futures they want for themselves and their communities rather than passively accept predetermined outcomes.

Suzanne E. Martin presents a Creative Futures Pedagogical Framework developed in Ireland's government-funded Creative Futures Academy project. Futures thinking is used to redefine curriculum structure, not just content or a communication tool. The framework aims to sustainably transform creative teaching and learning, challenging standard module formats and creating flexible, stackable learning models that redefine how design knowledge is created and delivered in higher education.

Clare M. Cooper explores the integration of design futuring principles into foundational visual communication pedagogy through two original visual thinking tools of five square futuring and design timescapes. Through Participatory Action Research across two teaching cycles, she demonstrates how embedding basic futuring tools in visual communication education helps design students develop critical thinking about temporal dimensions and imagine more equitable futures. The article argues that visual communication pedagogy is an impactful space for expanding futures literacy in design practice, positioning designers to better communicate arguments for preferable futures.

Silvia Torri, Victoria Rodriguez Scho, and Manuela Celi developed guidelines for using moodboards in Metadesign, a strategy-analytical process for codifying cultural signals in project design. Based on a company consulting project, their guidelines position moodboards as tools that link futures theory and design education,

allowing students to visualize complexity, co-create, and connect short-term trends with long-term visions. By codifying values and behaviors through moodboards, design students develop futures-oriented creative and analytical skills for anticipatory design practice.

Julieta Matos-Castaño, Cristina Zaga, Klaasjan Visscher, Corelia Baibarac-Duignan, Sabine Wildevuur, and Mascha van der Voort present Responsible Futuring as a methodological framework to create transdisciplinary spaces of co-speculation in schools. Through case studies in smart city development and embodied AI, they demonstrate how this pedagogical complement helps diverse communities collaboratively envision alternative futures while addressing power dynamics and multiple worldviews inherent in futuring practices.

Zijun Lin, Beatrice Villari, Ming Yan and Mansu Wang explore how integrating speculative and systemic design approaches can transform Chinese service design education, which currently emphasizes linear, solution-oriented thinking. Through student workshops and expert interviews, they show that these approaches help cultivate futures literacy and systemic awareness, enabling students to shift from isolated problem-solving toward holistic, futures-oriented design reasoning.

In an evocative essay, Laura Barendregt, Roy Bendor and Bregje F. Van Eekelen identify three meanings of criticality in design futures education, arguing that attentiveness to power is most crucial for transformative change. Their essay connects critical pedagogy and critical futures studies to engage with the political aspects of future-making, moving beyond deconstruction toward generative and participatory practice.

Yasuyuki Hayama and Ammer Harb introduce More-Than-Death as a concept that reframes death beyond human-centered exceptionalism. Building on More-Than-Human and posthumanist discourse, they position death as a relational and generative condition integral to ecological futures, proposing alternative scenarios from ecological rituals to digital memorialization and interspecies mourning.

As the report, Yanru Lyu, Lin Zhu and Zhiyong Fu analyze the International Conference on Design Futures as a durational event fostering a design futures ecosystem. Their report examines how the conference's distributed structure—through keynotes, workshops, and idea labs—functions as a knowledge-action network that enhances interdisciplinary interactions and connects stakeholders to advance the design futures community.

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