

Exploring Diverse Dimensions of Design Research and Innovation in the Changing World

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In today's fast-changing world, the design field has expanded to encompass many dimensions and applications. Starting with an analysis of the short papers proposed in the context of the IASDR 2023 conference, this essay delves into the fascinating range of topics, approaches, and formats covered and presented. This analysis has shed light on the different aspects of design research and innovation that drive progress in various design-related sectors. These papers collectively underscore the multidisciplinary and transformative nature of contemporary design research, demonstrating how innovation in technology and design, coupled with attention to social concerns and education, can shape a brighter and more sustainable future. Specifically, this essay discusses the evidence emerging from the current changes in design research, including its contents, research actions, and methods of dissemination, from the point of view of young researchers (Ph.D. candidates and junior researchers in academia). The results present not only a change in design research contents – emerging from the broad range of short paper topics featured in each conference track – but also a tendency to adopt emerging and engaging formats for research dissemination (short papers, posters, exhibitions, podcasts, etc.). They underline the importance of exploring different dimensions of research and dissemination of design and innovation that are consistent with our changing world.

Keywords: *dissemination, design research, new frontiers, short papers, research conference*

1 Introduction

Certain eras stand out as significant turning moments in history. A significant turning point happened in 2020, when the COVID-19 virus swept the globe like wildfire. The laws of society, economy, and daily life were completely rewritten as a result of its seismic repercussions, which went far beyond the field of medicine (De Vet et al., 2021). We are now facing a world that has changed as we travel the challenging path of rehabilitation and adaptation. In addition to restoration, this new world necessitates a reconsideration of what it means to be a human in this new era as crises have the power to alter our attitudes and actions drastically (Reeves et al., 2020).



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The International Association of Societies of Design Research (IASDR) 2023 conference theme, "Life-Changing Design," deals with the crucial changes, questioning us on the role of design in this post-pandemic era and in these transformation processes. At its core, this theme recognizes that the pandemic has permanently changed our lives, communities, and planets. Why? In this context, the idea of "Life Changing Design" is highly relevant. This encapsulates the idea that design, in its full range of meanings, is our guide through the turbulent waters of a world transformed by the pandemic. This statement emphasizes the necessity of reimagining, rebuilding, and reforming instead of just recovering.

As a result, design is incredibly dynamic and has always played a pivotal role in shaping our world (Papenek, 1984). In response to the outbreak of the pandemic, its role has become even more pronounced. According to what Buchanan prefigured (2001), design confirms that it is not just a problem-solving activity but a way of knowing and understanding the world. In fact, he suggested that design researchers should embrace this perspective to address complex, real-world problems. This perspective is emphasized nowadays, in a post-pandemic era, in which we absolutely need to imagine and propose solutions for a novel living paradigm. Thus, design has become a guide, as it offers solutions to the complex problems that the pandemic has brought about. This is where our journey begins – at the intersection of life-changing events and the ever-adapting field of design. In this paper, we will try to explore design's profound influence in a post-pandemic world through an analysis of the most relevant themes coming from the collection of short papers published under the "Short papers track". We will delve into its capacity to not only respond to crises but also to reimagine the very foundations of our daily lives, and future scenarios. Moreover, as we elaborate this panorama of topics, we will witness design itself undergoing a metamorphosis. It is renewing and redefining its purpose, embracing sustainability, empathy, and technology as guiding principles. From what emerged this transformation is also embracing the discourses on creative dissemination practices that are moving away from the most commonly used long formats of research dissemination that follow a standardized structure towards new short and dynamic ones. These new formats rethink the academic context in order to offer a platform for multimodal formats of research dissemination offering an orientation towards experimentation and multimodality (Dierckx et al., 2022).

2 Design research and new dynamic formats

Design research, once synonymous with aesthetic exploration and artistic expression, has transcended conventional boundaries to become a vibrant and dynamic domain where innovation and creativity converge. According to Chiu-Shui Chan (2015) innovation goes beyond just technological advancements and includes novel ideas, methods, and approaches. Innovation is not confined to the invention of new gadgets or products. It goes beyond that to include the development of fresh ways of doing things, enhancing existing processes, and discovering imaginative solutions to various challenges and problems. In the same way, creativity is not a standalone activity but an integral part of the design process (Howard et al., 2007). It involves creative problem-solving, iterative design, collaboration, design thinking, user-centered approaches, and the cultivation of creative cultures. These elements work together to inspire innovation in design.

The transformation of design research is nothing short of revolutionary. Beyond the traditional realms of product design and visual aesthetics, it has expanded to encompass a wide array of fields, from

service design and interaction design to sustainability-driven design and healthcare systems design. This expansion is driven by a desire to tackle complex, multifaceted challenges in our contemporary world, such as the global climate crisis, rapid urbanization, and the integration of technology into every facet of life (Wrigley and Mosely, 2022; Elia and Margherita, 2018). At the heart of this transformation lies a renewed commitment to rigorous empirical inquiry. Design research is increasingly influenced by methodologies borrowed from the natural and social sciences, enabling researchers to gain deeper insights into user behaviours, cultural contexts, and the intricate relationships between form and function (Rose and Johnson, 2022). Furthermore, the progressive diffusion of research is gaining importance in academia in a rapidly modernizing society with an increasing emphasis on the translation of research results. It has become imperative to explore alternative ways in which research advances can be communicated among academic peers and to the public (El Demellawy et al., 2017). Scholars, therefore concentrated on redesigning formats that can be easily understood (Ramos et al., 2020). Bucchi and Trench (2021) presented a multi-model framework of science communication to show the different models and objectives that research communities could benefit from communicating and disseminating. It is challenging and difficult to make research dissemination and communication effective and efficient, because it requires quite strong and well-grounded background knowledge on the research topics from audiences and the appropriate means and formats used by researchers to present and communicate. Dialogue and participation have been identified as useful ways not only to transfer knowledge from one audience target to another, but also to discuss the research implications, negotiate the aims and objectives, and co-develop and co-shape the research actions and potential impacts (Bucchi & Trench, 2021).

Specifically, in the design discipline, there is a high level of diversity in terms of research contents, research methodologies, research actions, and research results. The design research community has been exploring, studying, and experimenting with different ways and forms to present, communicate, and disseminate the research activities and results. Wallace and colleagues (2014) have practically reflected on a synergistic format for disseminating design research, especially promoting the Research Through Design approach to knowledge inquiry. They have introduced a novel format foregrounding the research artifacts by organizing in different ways, such as exhibitions and dialogical roundtable discussions, to show, validate, and reflect on the design practices and results. This exploration has offered an alternative research platform and format to go beyond traditional research dissemination formats that might hinder or limit the impact and effectiveness of practice-based design research projects. Short paper, as a compact but impactful research form of publication, has proven instrumental in advancing the frontiers of design knowledge. Such a format precisely serves as a dynamic platform for disseminating concise yet impactful findings, making them accessible to a broader audience and facilitating the rapid dissemination of ground-breaking research. In the design field, this format supports scholars in communicating novel design methodologies, innovative design solutions, and critical reflections on the evolving role of design in society. Through a comprehensive analysis of all accepted short papers, we shed light on how these succinct publications have reshaped the discourse in design research. From the integration of artificial intelligence and machine learning in the design process to the ethical considerations surrounding human-computer interaction, design research is poised at the forefront of technological and societal change. Short papers, with their agility

and accessibility, provide an ideal vehicle for sharing these pioneering ideas and findings with a global audience.

In summary, our journey through this collection of research papers underscores the limitless horizons of innovation across an array of domains. Whether it's enhancing museum experiences, preserving cultural heritage, revolutionizing healthcare, promoting data literacy, fostering inclusive design, or understanding user acceptance, innovation is the common thread that binds these transformative ideas. It is the engine of progress in our ever-evolving world, continually reshaping our future.

3 New frontiers of design research: evidence from short papers

The discipline of design and innovation has grown to include a wide range of dimensions and applications in today's ever-changing world. This evolution is well represented in the wide range of topics proposed and covered in the context of the "Life-Changing Design" conference of the International Association of Societies of Design Research (IASDR) in 2023. The numerous accepted proposals shed light on the different aspects of design and innovation that are driving progress in various industries.

Specifically, this essay reflects on the different contents of the short articles collected. Through the discussion on the different tracks, this dynamic format exemplifies the panorama of scientific research in design in Organizations and Policies (Mortati et al., 2018), Products and Production (Joyce, 2017), Identities (Coenraad et al., 2019), Ecosystems (Vezzoli et al., 2022), Communities (Savacool et al., 2022), Education (Irwin et al., 2022), Spaces and services (McPhgearson et al., 2022), Interactions (Bohnsack et al. ., 2022), and Heritage (Brown and Vacca, 2022). These articles demonstrate how innovation in technology and design, combined with a focus on societal issues and education, may shape a brighter and more sustainable future, highlighting the transdisciplinary and transformative nature of modern design research.

Sustainability is one of the most significant themes (Bejan et al., 2022; Rocha et al., 2019; Vezzoli et al., 2018; Ceschin and Gaziulusoy, 2016). Design definitely deals with the creation of solutions that stand the test of time while minimizing their environmental impact. Environmental sustainability is a pressing concern, and design plays a pivotal role in promoting eco-conscious practices. Initiatives like fostering sustainable food systems through design interventions address critical issues like food security and waste reduction. Integrating sustainability into design for health and well-being ensures that the environmental impact of healthcare practices is considered. Design also engages children in environmental consciousness, creating a new generation of environmentally aware citizens through engaging activities and experiences. These initiatives highlight design's capacity to drive positive change in the realm of environmental sustainability. Additionally, nature-inclusive design approaches reflect a growing awareness of the importance of harmonizing human-made environments with the natural world. Such approaches consider non-human species and ecosystems, emphasizing coexistence and mutual benefit.

Another central theme that emerged from the analysis of the submitted papers is the power of design to engage and educate. Design is utilized, for example, as a tool to create immersive experiences, bridging the gap between technology and human experience, a concept often referred to as "experience blend." Design for immersive experiences is at the forefront of technology integration in

various sectors. As an example, interactive installations in science centers engage visitors on a new level, facilitating embodied experiences and learning. Moreover, the use of technology to preserve cultural heritage through interactive methods ensures that intangible aspects of our past are not lost to time. These design initiatives showcase how technology and design can come together to create captivating, educational, and memorable experiences for individuals of all ages.

The potential for innovation also extends to healthcare. The intersection of design and healthcare is marked by innovation aimed at improving well-being. Design interventions are explored to aid individuals in coping with conditions like anxiety disorders or facilitating communication for the elderly with impairments. Design is a dynamic force that propels progress by addressing real-world challenges through creative problem-solving. Additionally, design plays a pivotal role in enhancing the patient-doctor relationship. Promoting self-care and data literacy in healthcare empowers individuals to recognize and address health issues effectively. These applications highlight the design's potential to not only transform healthcare but also enhance overall well-being and quality of life. Furthermore, studies on dementia care underscore the significance of environmental well-being in design for aging populations. By creating dementia-friendly communities that prioritize environmental aspects, these designs not only enhance the quality of life for individuals with dementia but also contribute to a more sustainable and compassionate society.

Many studies also emphasize the importance of interdisciplinary collaboration. Whether it's co-designing with children with cerebral palsy to create inclusive playgrounds or developing sustainable food systems through collaboration between agriculture and design experts, interdisciplinary approaches are crucial for addressing complex challenges. Design thinking provides a framework for multi-actor, interdisciplinary processes aimed at fostering change. It encourages the synthesis of diverse perspectives and expertise, resulting in holistic and effective solutions. In fact, multi-actor, interdisciplinary processes are vital for sustainable regional revitalization, where various stakeholders collaborate to revitalize communities. These collaborative efforts emphasize the importance of collective wisdom and diverse perspectives in shaping the future. Furthermore, empathy in co-creative design processes acknowledges the importance of understanding and connecting with users on a deeper level. This approach fosters collaboration and ensures that designs address real human needs and emotions. The theme also underscores the significance of reflecting on design processes and considering user perspectives throughout the design journey. A series of critical examinations of design methodologies and user perspectives are essential for continually improving design outcomes and ensuring that designs are not just functional but also meaningful and relevant to the people they serve. Collaboration and community engagement are cornerstones of effective design practices that address complex societal challenges. This theme encompasses various facets of collaborative design. Co-design approaches involving various stakeholders, as seen in the research on rural revitalization in China, exemplify the power of collective intelligence. By bringing together designers, government agencies, non-governmental organizations, companies, and residents, these initiatives create more comprehensive and effective solutions for sustainable rural development. Furthermore, systems thinking in codesign emphasizes the importance of holistic problem-solving. It considers the interconnectedness of various factors and stakeholders in complex systems, guiding the development of solutions that address multiple dimensions of a problem. Collaboration between in-house designers and public sector auditors introduces fresh perspectives into traditionally knowledge-driven fields.

This collaborative effort strives to enhance the impact of auditing by incorporating citizens' perspectives and promoting knowledge-in-action.

In addition to these practical applications, design is also examined through a cultural and historical lens. Design's impact on cultural perceptions and preservation of heritage is profound. Whether it's the influence of design on artistic interpretations or the historical significance of design choices, culture and history are intertwined with design. Moreover, design is instrumental in preserving intangible cultural heritage, ensuring that traditions, practices, and knowledge are passed down to future generations. This aspect of design reminds us of its role as a guardian of our cultural identity, where aesthetics and functionality meet tradition and history.

Cultural preservation and heritage are central themes in design that honour traditions and celebrate diversity. Design becomes a means of honouring and celebrating the richness of human culture and history. Some examples are the revival and preservation of traditional Japanese dyeing techniques, which represent a dedication to safeguarding cultural artistry. Furthermore, the preservation of Yunnan's intangible cultural heritage emphasizes the importance of safeguarding unique cultural practices. Similarly, the design of Dementia Friendly Communities demonstrates how design can pay homage to cultural traditions and practices. By creating environments that honour the past while addressing the needs of individuals with dementia, these communities embody a respectful and inclusive approach to cultural preservation.

Technological innovation is also a recurring topic, in different studies. Accordingly, technological innovation and the use of advanced design tools are fundamental in pushing the boundaries of creativity and functionality. The integration of AI in design ideation processes is at the forefront of modern design practices. It opens new horizons by augmenting human creativity with machine intelligence. By utilizing AI to generate design ideas, designers can explore unconventional solutions and break free from traditional design constraints. The utilization of speech-to-text technology in interactive media art is another testament to the transformative power of technology in the design world. It allows artists to create immersive and interactive experiences, bridging the gap between art and technology. Moreover, the design of digital humans with advanced technology represents a fusion of cutting-edge innovation and artistic expression. It raises questions about the nature of identity and the role of technology in shaping our understanding of the self. However, it's essential to remain vigilant about potential biases introduced by these advanced tools. Investigating cognitive biases in generative AI tools is a critical aspect of responsible design. It ensures that technology serves as a creative tool rather than reinforcing existing biases.

Lastly, the essays underscore the importance of data and evidence in design. Data-driven design is transforming how we approach problem-solving and decision-making. In-app surveys and data visualization tools enhance our understanding of user experiences, enabling more informed design choices. Tracking and visualizing behavioural data through comics make complex data engaging and accessible. Evidence-based design and evaluation in healthcare ensure that interventions are grounded in data, promoting better outcomes and patient care.

The final analysis of all the papers submitted, as part of the Short Paper track, thus revealed a dynamic and easy look at the vast and diverse world of design and innovation. From interactive experiences to cultural preservation, from problem-solving to interdisciplinary collaboration, the scope of design is

broad and multifaceted. The discipline serves as a driving force in addressing contemporary challenges and shaping the way we experience and interact with the world around us. Design, it seems, is limited only by our imagination and willingness to explore its myriad possibilities. Design appears as a dynamic and multifaceted discipline that encompasses sustainability, human-centered approaches, cultural preservation, technological innovation, collaboration, and reflective practices. These themes collectively shape the modern world, providing solutions that not only enhance functionality and aesthetics, but also contribute to a more sustainable, inclusive, and culturally rich society. Design is not simply an aesthetic endeavor; it is a driving force that addresses the challenges and opportunities of our changing world, continually evolving and adapting to shape a brighter, more innovative future for all.

4 Conclusions

The field of design research is witnessing an evolution in its concepts and a subsequent transformation in the formats used to communicate scientific findings. Traditional formats like academic papers and presentations are being complemented and, in some cases, supplanted by newer, more engaging formats (Dierckx et al., 2023). Over the years, the format and communication of design research have evolved significantly, driven by advancements in technology, changing audience expectations, and the need for interdisciplinary collaboration. This evolution is driven by several factors, including the need for more accessible and engaging dissemination of knowledge, the rise of interdisciplinary collaboration, and advancements in digital technologies (Bowen and Graham, 2013). Among the semi-traditional formats for scientific dissemination, short papers are emerging as concise documents that encapsulate key research findings particularly valuable in design research for their ability to deliver focused content efficiently. They are gaining popularity due to their ability to efficiently convey key research findings without the verbosity of traditional academic papers. They allow researchers to present their work in a concise and focused manner during conference sessions. Moreover, short papers bridge the gap between different design disciplines and facilitate cross-disciplinary communication. As previously described in this paper, researchers from various fields can use short papers to share insights, fostering collaboration and the exchange of ideas. In this context, short papers also demonstrates an opportunity to easily describe applied case studies and concise reflections on new topics, exploring the boundaries of design research providing overview of new studies.

On the other side, it is clear that, due to their brevity, short papers cannot provide the same level of detail as full-length research papers. Researchers must strike a balance between brevity and providing sufficient information for understanding. To overcome such a limitation, researchers must carefully select which findings to include, focusing on those most relevant to the research objectives. This straight-to-the-point approach could help close the gap between knowledge and practice, allowing the pool of dissemination and use of research content to be expanded.

In conclusion, short paper tracks at design conferences serve a pivotal role in offering a condensed yet insightful overview of interesting research cases within a specific theme or topic. These tracks provide a platform for researchers to present their work concisely, highlighting key findings, methodologies, and implications. The efficacy of short paper tracks lies in their ability to efficiently introduce diverse research projects, encouraging attendees to explore further and engage in discussions. By curating a

selection of short papers around a common theme, conferences enable participants to gain a comprehensive understanding of the latest developments, innovative solutions, and emerging trends in a specific area of design research. Short paper tracks, through their brevity and thematic focus, foster dynamic knowledge exchange and create opportunities for collaboration, making them a valuable component of design conferences.

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