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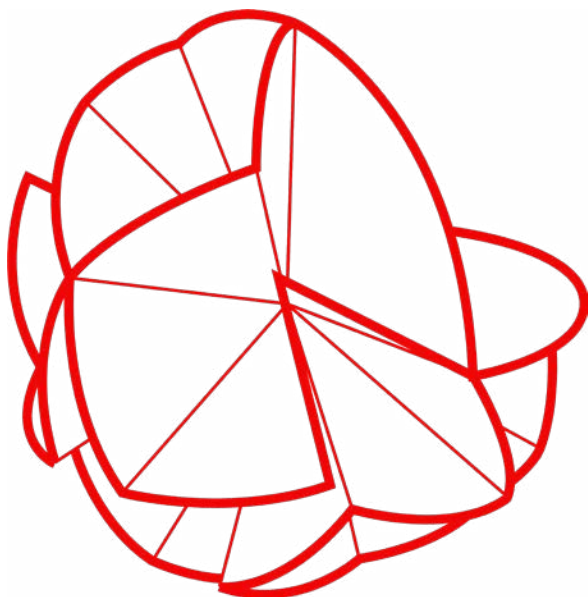
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DIGITAL  
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1

## Disrupting Geographies in the Design World

Proceedings of the 8<sup>th</sup> International  
Forum of Design as a Process

Alma Mater Studiorum — Università di Bologna



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(Eds.)

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# Colophon

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# Contents

## Contents

14

**The Latin Network for the Development  
of Design Processes**

16

**8th Forum Main Partners**

18

**Disrupting Geographies  
in the Design World**

20

**People**

26

**Impact**

**Track 1**

# **There's No Plan(et) B: Sustainable Transitions to Systemic Planet-Centric Design**

30

**There's No Plan(et) B.  
Sustainable Transitions to  
Systemic Planet-Centric Design**  
Erik Ciravegna, Clara Giardina, Davide Pletto

40

**Beyond Collaboration: A Network Analysis  
of Local Stances and Global Frameworks  
in the Collective Design of the City**  
Francesca Sabatini, Martina Massari,  
Saveria Olga Murielle Boulanger

50

**Alter\_Azioni: Designing  
between Biological and Artifactual.  
Scenarios for a Short-Term Future**  
Pietro Costa, Raffaella Fagnoni

62

**(Systemic) Design for Sustainable  
Territorial Transition: A Literature  
Review of State of the Art**  
Asja Aulisio, Silvia Barbero, Amina Pereno

72

**Dasein ist Design:  
An Ontological Discussion of Design  
in the Ecological Crisis Time**  
Sabrina Lucibello, Carmen Rotondi

80

**The More-Than-Human Trend  
in Design Research: A Literature Review**  
Annapaola Vacanti, Francesco Burlando,  
Isabella Nevoso, Massimo Menichinelli

90

**Being and Nature.  
The Aesthetic Ecocentrism**  
Adriano Pinho, Francisco Providência

102

**Forward to the Primitive.  
New Sustainable Design Processes  
Characterized by Primitive Aesthetic**  
Jurji Filieri, Elisabetta Benelli

110

**How Long Does It Take For a Paradigm Shift. A Design-based Critical Essay on Materials and Fabrication Processes**  
Guilherme Giantini, Lígia Lopes

118

**Sustainability Needs Service Efficacy**  
Chiara Olivastri, Giovanna Tagliasco

126

**Systemic Design Applied to Medtech. Guidelines for Corporate Training on Sustainable Healthcare**  
Enrica Ferrero, Giulia Ferrero

138

**Reducing Waste in Healthcare: A Systemic Design Approach for Sustainable Disposables Manufacturers**  
Gabriele Maria Cito, Angela Giambattista

150

**A Framework to Design Appliances for the Circular Economy Scenario**  
Chiara Battistoni

162

**Digital Fashion Technologies & Practices: Design Driven Sustainable Transition in Fashion Industry**  
Ludovica Rosato, Alberto Calleo

170

**Material Resources as a Contextual Complex System**  
Michele De Chirico

180

**Diffuse Micro-Factory: Circular Distributed Production System for Microbial Nanocellulose**  
Lorena Trebbi

190

**From Sea to Fashion. Seaweeds as Material for a Sustainable Transition**  
Paolo Franzo, Clizia Moradei

198

**The Sound of Sustainability. Biomaterials and New Sensory Frontiers**  
Giovanni Inglese, Sabrina Lucibello, Carmen Rotondi

208

**Unpacking Ceramic History in Asia and Europe: Contribution to New Reusable Packaging Design**  
Raquel Gomes, Cláudia Albino

## Track 2

# Intersectional Design for an Accessible and Empowering World

220

**Intersectional Design for an Accessible and Empowering World: Views from the 8th Forum of Design as a Process**  
Valentina Gianfrate, Lígia Lopes, Margherita Ascari, Simona Colitti

226

**Viva! Colinas. Service Design for Tourism and Reconciliation in Communities of Former Colombian Guerrilla**  
Beatriz Bonilla Berrocal

238

**The Digital Archive as an Inclusive Tool for Knowledge Construction Through Design Practices**  
Alessandra Bosco, Fiorella Bulegato, Silvia Gasparotto

248

**Intercultural Design Approach. Narrative Design for a Multicultural Society**  
Irene Caputo, Marco Bozzola, Claudia De Giorgi

258

**From Wayfinding to Placefinding.  
Orientation and Alterity in Urban Spaces**  
Daniela D'Avanzo, Salvatore Zingale

268

**A Meta-Analysis for an Interactive,  
Intersectional and Inclusive  
Exhibition Based on the SDGs**  
Sergio Degiacomi, Francesca Zoccarato,  
Simone De Pascalis, Pietro Crovari,  
Fabio Catania

278

**From Empathy to Inclusive Design:  
Multisensory Solutions for (Not Only)  
Socially Sustainable Projects**  
Federica Delprino

288

**Etnography in Sever Do Vouga:  
Reality<>Change First Step to Engage  
a Creative and Rural Community**  
Pedro Fragoso Lopes, Gonalo Gomes

298

**The Implementation of U.D. in a Metal  
Processing Plant of the Metropolitan  
Zone of Guadalajara (MZG)**  
Luis Erik Hernandez Sanchez, Enrique  
Herrera Lugo, Jaime Francisco Gomez  
Gomez, Francisco Javier Gonzalez Madariaga

312

**Towards Better Public Sector Innovation.  
Co-designing Solutions to Improve  
Inclusion and Integration**  
Ilaria Mariani, Francesca Rizzo, Grazia  
Concilio

322

**Creating Methodological  
Design Processes for Empowering  
Artisans of Cali, Colombia**  
Edgar Andres Martnez Muoz,  
Diana Marcela Giraldo Pinedo

332

**Empowering Through Design:  
Regional Development Strategy  
of Los Lagos as an Intersectional Case**  
Daniel Moreno, Katherine Mollenhauer,  
Arturo Orellana

344

**Inclusive Merchandising.  
A Storyteller for an Accessible University**  
Monica Oddone, Marco Bozzola,  
Claudia De Giorgi

354

**Geopolitics of Fashion. Glocal Power  
Evidence and Design Activism for Leading  
Disrupting Textile Debris in Chile**  
Barbara Pino Ahumada

366

**Intersectional Design in Practice: A Critical  
Perspective on Sustainability for All**  
Alessandro Pollini, Pilar Orero,  
Alessandro Caforio

374

**Empower to Care or Care to Empower?  
The Theory Behind the Practice  
That Transforms**  
Marcia Santos da Silva, Gustavo Severo de  
Borba

384

**Perspectives of Sound: Promoting  
Social Inclusion Under the Principle  
of "Access for All" in Museums**  
Yi Zhang, Raffaella Trocchianesi

# Design and Responsive Technologies for Human Wellbeing

396

## **Design and Responsive Technologies for Human Wellbeing**

Mirko Daneluzzo, Michele Zannoni,  
Giorgio Dall'Osso, Silvia Gasparotto

406

## **Counterpoint. Are We Sure That All These Data Are Good for Us?**

Antonella Valeria Penati,  
Carlo Emilio Standoli

418

## **Sustainable Data-Driven Strategies and Active Well-Being: A Case Study**

Giuseppe Mincolessi, Gian Andrea  
Giacobone, Michele Marchi

426

## **Are You Me? Re-Embodiment Process for Telepresence Robots**

Lorenza Abbate, Claudio Germak

440

## **From Applications to Implications: Design as a Process for Humanising Future Robotics**

Christiam Mendoza, Roberto Íñiguez Flores,  
Ruth León Morán

450

## **Data Driven Design: From Environment to the Human Body**

Elena Cavallin

458

## **IF THIS THAN THAT Broken Linear Logic. Rethinking and Representing the Design Process**

Margherita Ascari, Andrea Cattabriga,  
Simona Colitti, Ami Liçaj

468

## **Responsible Tech Innovation Through Design: A Participative, Reflective, and Systemic Approach**

Jane Vita, Tiina Mäkelä, Teemu Leinonen

478

## **(Re)Active Materials. Well-Being's Concept Evolution and Advanced Material Innovations**

Noemi Emidi

490

## **Mixed Reality as Activator of Collaborative Processes for Transcultural Future**

Alessandra Miano

500

## **Exhibitions as Hybrid Environments. Exploring Situated & Embodied Interaction in Cultural Heritage**

Letizia Bollini, Marco Borsotti

512

## **Ethnographic Study: Finger Food Systems, Contribution to a Project Program in Food Design**

Lígia Afreixo, Francisco Providência

522

## **PASSO Project: Design of a Smart System Using Biofeedback to Train People with Parkinson's Disease**

Silvia Imbesi, Giuseppe Mincolessi

532

## **Pathos: A digital service to improve women's hospital experience**

Elisa L'Angiocola, Angela Giambattista

544

## **Brain Training, Mindfulness, and Wearables: Empowering Employee Wellbeing Through Neurotechnologies**

Francesca Bonetti, Giorgio Casoni

554

## **The Augmented Body: Technological Contamination in the Fashion-Tech Paradigm**

Elisabetta Cianfanelli, Margherita Tufarelli,  
Elena Pucci

564

## **Health Communication as Apo-Mediation. The Impact of Communication Design on Health Prevention and Perception**

Daniela Anna Calabi, Alice Maturo

# Design Values Out of the Mainstream: New Geographies of Influence

578

**Design Values Out of the Mainstream:  
New Geographies of Influence**

Qassim Saad, Andreas Sicklinger,  
Lorela Mehmeti

588

**An Analytical study to develop  
the traditional craft in the field  
of creative industries in Egypt**

Hoda Aman

600

**Enhancing social well-being through  
social innovation approach and design  
expertise: a case study for social  
innovation in a local district in Turkey**

Yagmur Gizem Avci, Ece Cinar, Cigdem Kaya

610

**Cultural Factories: Conversion of Industrial  
Areas into Cultural Hubs**

Eva Vanessa Bruno, Beatrice Lerma,  
Doriana Dal Palù, Claudia De Giorgi

620

**Bahrain Knowledge Bay. Using Design  
Thinking to Establish an Infrastructure  
Towards Knowledge Economy**

Halim Choueiry

630

**Culture and creativity as assets  
for inclusive growth in small  
and remote places: a design-led process**

Annalinda De Rosa, Davide Fassi

640

**Culture-based Innovation:  
A Localized Approach for Designing**

Alaa El Anssary, Ahmed Wahby

650

**Burning approaches to tensing  
the present: a new political  
dimension of design**

Fabiana Marotta

658

**Design Resistance. Material  
Solutions for local remoteness**

Martina Taranto, Barbara Pollini,  
Valentina Rognoli

668

**How Should Technology Follower  
Companies of Developing Countries  
Innovate Through Design Capability?**

Bilgen Tuncer Manzakoğlu

680

**Subjectivation and cities: relationships  
between local independent fashion  
and Possible Future Scenarios**

Paula Visoná, Mágda Rodrigues da Cunha,  
César Kielling

# New Education Pathways for Future Designers in a Changing World

696

## **New Education Pathways for Future Designers in a Changing World**

Valentina De Matteo, Elena Formia,  
Roberto Iñiguez Flores, Laura Succini

706

## **Decolonizing the Design Process: A Case Study in Authorship, Power, and Control**

Scot Geib

714

## **OpenMind Handbook. A System of Design Tools and Processes to Empower Democracy Culture in Primary Schools**

Valentina Facchetti, Laura Galluzzo,  
Ambra Borin

724

## **Architecture, Design and Community in Colombia. More Urban, More Rural, More Social: The Workshop Experience**

Sasha Londoño-Venegas,  
Adriana Jaramillo Botero

736

## **Creative Community for Generation Z Teachers in Brazil Through Strategic Design**

Lara Maria Luft, Debora Barauna,  
Gustavo Severo de Borba

746

## **Design Thinking and Career Development: A Comparative Study**

Clio Dosi, Eric Guerci, Jacek Jakieła,  
Joanna Świętoniowska, Eleni Vordou,  
Maria José Varadinov, Matteo Vignoli,  
Gastão de Jesus Marques, Joanna Wójcik

760

## **Design Processes: From the Historical Perspective to the Application in Startups Companies**

Isabela Moroni, Amilton Arruda

772

## **Design and Innovation: Where Do We Want to Play? Inquiry Into Some Design's Strengths and Weaknesses in Innovation**

Marco Limani

782

## **Design Ecosystem in Portugal. Education, Research and Entrepreneurship**

Marlene Ribeiro, Francisco Providência

790

## **The Design Posture: A Collaborative Learning-By-Doing Approach**

Rita Duina, Marco Berni, Andrea Del Bono

798

## **Advanced Manufacturing for Sustainable Fashion. Developing Interdisciplinary Educational Experiences**

Daria Casciani

810

## **Co-designing Contents With Situated Stakeholders: An In-Field Process in Nolo (Milan)**

Davide Fassi, Francesco Vergani

820

## **Creativity and Mirror Effect: Teaching Creative Skills Through Non-traditional Pedagogies**

Alejandra Amenábar Alamos

830

## **How Design Thinking Could Benefit Future Educational Environments in a Post-Pandemic Era?**

Yuqing Zhu, Yunyu Ouyang

840

## **How a Technology Identity Can Enhance the Diffusion of Good Design Practices in Product Sound Design**

Daphne Degiorgis, Marco D'Addario,  
Beatrice Lerma, Doriana Dal Palù

852

## **Learning and Teaching From and by Social Media. Instagram to Support Blended Learning Models**

Vittorio Linfante, Andrea Manciaracina

864

## **Education & Practice in Open Design. Improving the Learning Experience Through Knowledge Connections**

Fabrizio Valpreda

876

**You Can Never Solve Problems With  
the Same Mindset That Created Them.  
How Can We Change the How and the  
What We Teach to Enable Our Students  
to Become Truly "Terrestrial" Designers?  
A Proposition Following Bruno Latour's  
"Terrestrial Manifesto"**

Angela Grosso Ciponte, Evelyne Roth

884

**Good for Good. Designing  
Packaging in the Era of Deliveries**

Loredana Di Lucchio, Ivo Caruso

896

**Onboarding Future Systemic  
Innovation Designers Through  
Informal and Collaborative Activities**

Leonardo Moiso, Sofia Cretaio,  
Cristina Marino, Chiara L. Remondino,  
Paolo Tamborrini

908

**Material Practices in Transition:  
From Analogue to Digital in Teaching  
Textile and Fashion Design**

Delia Dumitrescu, Martina Motta

918

**Designing for the Future of  
Education Through Cultural Heritage**

Nour Zreika, Daniele Fanzini

928

**We Need to Talk About Learning Design.  
A Proposal for Critical Conversation**

Suzanne E. Martin

938

**Collaborative Learning of Ph.D.  
Candidates in Design on Emerging  
Scenarios in Scientific Publication**

Eleonora Lupo, Sara Radice

948

**Scenarios, Networks and Systems:  
An Alternative to Dichotomous Patterns**

Liana Chiapinotto, Fernando Guimarães  
Horlle, Tássia Ruiz, Celso Carnos Scaletsky



# The Latin Network for the Development of Design Processes

The Latin Network for the Development of Design Processes is a group of researchers, academics, students and business professionals of Latin languages and cultures who study and operate in a particular field of design known as design processes. They meet in a Forum, conceived as an international specialised conference, to engage in lively discussions and debates about their studies and experiences.

The Network was founded in 2008 with the “Carta di Torino” manifesto. Since its very beginning, Professor Ph.D. Flaviano Celaschi has been leading a team that, over the years, guaranteed the cultural and scientific focus of the members of the Network, fostering inter-institutional cooperation. Since 2015, the Network has been hosted by the Alma Mater Studiorum – Università di Bologna, within the Advanced Design Unit (ADU) of the Department of Architecture, coordinated by Professor Ph.D. Elena Formia.



So far, the members organised eight Forums, covering the following thematic axes:

**Design Cultures as Models of Biodiversity**

1st Edition

*Universidade do Vale do Rio dos Sinos, Porto Alegre, Brazil*

June 24-26, 2009

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2nd Edition

*Universidade de Aveiro, Aveiro, Portugal*

October 28-30, 2010

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3rd Edition

*Politecnico di Torino, Torino, Italy*

November 3-5, 2011

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4th Edition

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5th Edition

*Tecnológico de Monterrey, Campus Guadalajara, Mexico*

September 18-20, 2014

**Systems & Design. Beyond Processes and Thinking**

6th Edition

*Universitat Politècnica de València, València, Spain*

June 22-24, 2016

**Design & Territory: Emergencies and Conflicts**

7th Edition

*Universidad Nacional de Colombia, Sede Palmira, Colombia*

June 23, 2020

**Disrupting Geographies in the Design World**

8th Edition

*Alma Mater Studiorum — Università di Bologna, Bologna, Italy*

June 20-22, 2022

For more information about the Editions and related publications, see: <https://www.forumdesignprocess.org/dgdw22/past-editions/>

# 8<sup>th</sup> Forum Main Partners

## **Alma Mater Studiorum — Università di Bologna Advanced Design Unit Department of Architecture**

The Advanced Design Unit is a community of professors, researchers and experts who deal with design cultures and their continuous innovation. It operates in the University of Bologna through teaching activities, research, and the third mission.

<https://site.unibo.it/advanceddesignunit/it>

## **Tecnológico de Monterrey (TEC)**

Established in 1943, Tecnológico de Monterrey is a distinguished private nonprofit university dedicated to cultivating leaders with robust entrepreneurial acumen and a profound sense of humanity, making them globally competitive. With a presence in 26 cities across Mexico, the university boasts a student enrollment exceeding 65,000, encompassing both undergraduate and doctoral programs. Garnering recognition on the global stage, the QS World University Rankings (2021) position Tecnológico de Monterrey at an impressive 155th worldwide. Within its esteemed Escuela de Arquitectura, Arte y Diseño, the university nurtures talents in Architecture, Digital Art, Design, and Urbanism.

<https://tec.mx/es>

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**8<sup>th</sup> International Forum of Design as a Process**

# **Disrupting Geographies in the Design World**

**Alma Mater Studiorum — Università di Bologna**

**Bologna, June 20-22, 2022**



**Responsible Innovation**

**Social Justice**

**Ecocentrism**

**Changing Education**

**[www.forumdesignprocess.org/dgdw22](http://www.forumdesignprocess.org/dgdw22)**

How design is evolving to respond to the urgent needs facing our environment and society at large? How to understand and design the dynamic relations between artefacts, human beings and the ecosphere? How might design principles and practices adapt their approaches to attend to the diversity that characterised the world?

In an increasingly globalized world, new geographies in and of design offer the stage for negotiating ecosystem's complexity. Design is positioned as a key driver for improving the living standards of many, where human and environmental capitals are pivotal in local economies, and also for the connection to the rest of the world.

The 8th International Forum of Design as a Process (Bologna, June 20-22, 2022) featured speakers from the Global Design community, expanding the original vocation of the Latin Network for the Development of Design as a Process to include researchers and designers of the Mediterranean Area, Middle East, IOR (Indian Ocean Region), and Global South regions. The aim was sharing new perspectives on design futures with responsibility and justice, at the forefront of change, establishing strategic partnerships, and creating accessible knowledge.

The Forum, spanning three-days of meetings, reflection opportunities and networking activities, involved designers, scholars, young researchers, design entrepreneurs, opinion leaders, in an experimental format. Grounded in three pillars – seminars, workshops, and exhibitions –, the event aimed to attract audiences to Bologna, consolidating the potentials of the design world as hub for thought and creative production for present and future generations.

Speakers' contributions inspired the designers' community of practices, and resonated with students and the wide community, to connect design to all aspects of culture and life. This interdisciplinary approach explored the intersections of materiality and culture, post-coloniality, decoloniality, gender studies, and other areas of human thought and action which seek to analyze, question and challenge the disruptive geographies in the world, today.

Five tracks were proposed to address the different dimensions of design futures centered on responsibility and justice.

The submitted papers were reviewed, and a selection is published in this Digital Special Issue of *diid. disegno industriale – industrial design*. Each track begins with a red page containing the original text used in 2022 for the call for papers, also indicating the names of Chairs, Co-Chairs, and Track Editors. Following this, an introductory paper outlines the contents published in the form of research articles for each track.

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**Realists of a Larger Reality: Cities,  
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“Strange Wonder”**

# Education & Practice in Open Design. Improving the Learning Experience Through Knowledge Connections

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## **Abstract**

Learning complex disciplines traditionally requires the adoption of equally articulated methods and strategies. Design does not escape this principle, on the contrary it enhances some of its peculiar characteristics: very different skills, often not aligned development and application times, tools complexity, declare an environment where methods and practice had always defined a non-linear educational scenario (Cennamo et al., 2011). The paper discusses the matter while bringing a case study specifically defined with the purpose to test a new educational scenario where a student is put into conditions to experiment the entire Design process by himself, being connected with different competences inside a complex multidisciplinary environment, in order to develop a physical Design solution for a user with disabilities.

## **Keywords**

Open design

Multidisciplinary education

Fablab

Digital fabrication

Local production



## Introduction

Learning complex disciplines traditionally requires the adoption of equally articulated methods and strategies. Design does not escape this principle, on the contrary it enhances some of its peculiar characteristics: very different skills, often not aligned development and application times, tools complexity declare an environment where methods and practice had always defined a non-linear educational scenario (Cennamo et al., 2011).

This is even more true if we consider the operational aspects in the practice of “making”, where good design is realised in the prototype phase and then in the production of artefacts, smart devices, vehicles, or any other product of a process, whether physical or non-physical (Admiraal et al., 2019), or even services rather than communication content. Taking the case of Enzo Mari as an example could be considered banal, yet valuable for his contribution to the thought of a Design for All approach and set of methods, in which the person becomes actor of the process itself, thus determining the practice and the final result (Ryan, 1997). What this approach implies, however, is the necessary awareness of the complexity of Design in its overall path, from the initial need to its solution in the final design result. This complexity, of course, resides within the numerous disciplines that, today more than ever, are essential to the concretisation of the design process; this articulation of different knowledges becomes a primary educational necessity, especially considering the urgency of the environmental, economic, social, and cultural problems that we must face every day.

In fact, the possibility to invest time, money, competences and, at last, our global effort into a different approach to production of artefacts could lead us to a different story, where production is not anymore related to some other place, some other country, but instead it is strictly interconnected with local activities. Which is, at last, one of the more effective strategies to intervene into a global world, where global problems produce global negative effects, however much more damaging countries where production benefits do not belong to.

## Didactics Transformations and an Effective Strategy

Hence the need to significantly transform didactics in Design, which like all disciplines has seen over the years an increased sensitivity in this direction, with operational actions experimentations, sometimes very detailed (Sancassani et al., 2019); this condition depicts a clear direction, already outlined by the principles of Systemic Design (Sevaldson, 2013), where outputs of a system become input of another, in a continuous, flawless process.

Systemic Design implies, moreover, a new attention to the values of local production, not opposed but juxtaposed to global production, whose advantages cannot be hidden by the negative effects produced mainly by the flattening of territorial specificities, bent to low-cost production, to the advantage of some geographical areas, while being detriment of many others.



As given by Anderson (2013)

under somewhat different historical conditions, firms using a combination of craft skill and flexible equipment might have played a central role in modern economic life—instead of giving way, in almost all sectors of manufacturing, to corporations based on mass production. Had this line of mechanized craft production prevailed, we might today think of manufacturing firms as linked to particular communities rather than as the independent organizations that, through mass production, seem omnipresent (p. 69).

One last element must be introduced, however, specifically in the field of information, being it the basic ingredient of knowledge: if it's true that a key element of the transformations we are talking about is the connection of knowledges, then it is necessary to rethink the principles on which we base the transmission and sharing of content, specifically referring to what we know about a subject that is undergoing design investigation. It means opening to diverging logics, somehow distant but not in contrast with traditional intellectual protection, certainly not to violate the rights of those who develop such knowledge, but on the contrary to enhance their identity on a local and global level.

Complexity, global issues with local effects, the need to extend skills, access to knowledge, enhance localisation by consciously exploiting the global network: these are challenges that, in order to be addressed, cannot but pass through the filter of a multidisciplinary approach, of interconnections between different knowledge, to be learned in the field, even before the level of higher education (Admiraal et al., 2019).

In fact, this set-up has the possibility to be enabled immediately, on a solid and dynamically evolving basis, by bringing the contemporary Designer closer and closer to places, methods and people who are already working on these fields, i.e., exploiting the Open Design movement, which through the Makers in Fablabs communities has been active for over three decades in the field of local, digital, interconnected and shared production (Anderson, 2013).

While it is true that Fablabs and Makers have existed for so long, it is also true that they have never really emerged in the field of practical and effective production, and this is not so much due to wrong choices or strategic errors, but more incidentally; it is to highlight a structural difficulty in adhering to globally standardised models of production, which badly intersect the trajectories of local, digital and interconnected action of Makers. However, curiously enough, this problem crosses the road of globalised production, making it critical within contemporary society, especially considering the environment issues and the social balance urgently needing to be restored on a global level.

Is it a good opportunity, then, to act in synergy between the level of global tradition and local innovation? The easy answer is yes, but it requires to rethink the training of the Designer, who can no longer follow traditional paths (Silva Pacheco, 2019). It is necessary to restart by experimenting new ways of learning the discipline of Design, experimenting in the field the practice of interfacing with other knowledge, whatever it may be, necessary from time to time to the cause of conscious design.

## Case Study

The case study Design environment of the *Gamelon Pad* project, developed within the research activities of the Open Design group, where Making and Local Production connections are experimented, as part of the *virtuaLAB* (Politecnico di Torino) activities, in collaboration with *Fablab Torino*.

The objective of the project is the practical experimentation of the principles of Open Design (Aparisi et al., 2021), through the methodologies of local production, with digital fabrication tools, but above all in connection with networked knowledge strictly related to specific needs. In detail, the project addresses one of the areas that best match the principles of enhancing the Design for People, to support their needs, especially when these are particularly important, such as the inclusion of subjects who otherwise could not enjoy specific experiences due to disabilities of various kinds (Peng et al., 2022).

Disabilities are inherently challenging (O'Kane, 2016), because they are always particular, not easily framed in standards, commonly specified and designed for people without disabilities. For this reason, they are an ideal case for experimentation, due to their specific complexity and, above all, to the fact that the traditional approach has clear difficulties in meeting these specific needs.

In detail, the purpose of the research consists in the development, up to the level of a local, personalized production, of a game controller device, a gamepad for video games adapted for use by people with orthopaedic/motion disabilities, or generally related to the sphere of body movement.

The disciplinary scheme of the project Fig. 1 represents the inclusion of the methodological aspects of Open Design, orthopaedic/motion skills, hardware and software technological expertise, 3D virtual modelling and digital additive manufacturing.

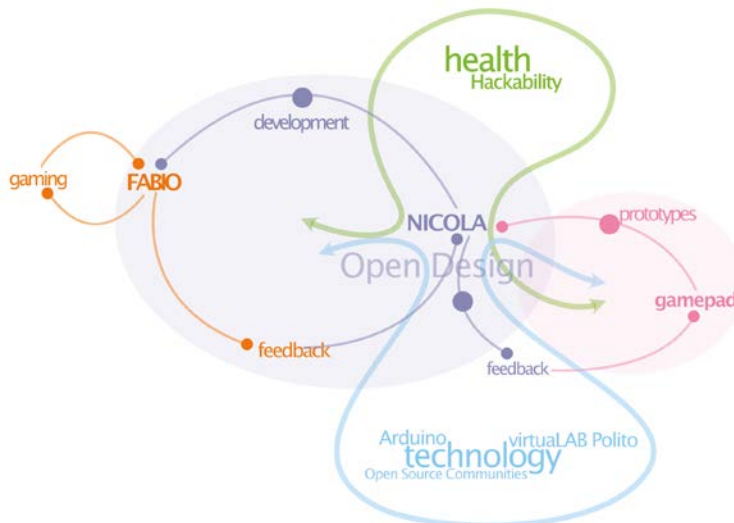


Fig. 1  
Gamelon Pad. Methodology scheme with Design process and disciplines. Scheme, by F. Valpreda, N. Scalzotto.

What characterises the project, however, is the fact that all these skills have been acquired by drawing them from the experts in the field by a single student of the bachelor's degree in Design and Communication of the Polytechnic of Turin. This choice led to the definition of an experimental didactic scenario specifically useful for the purpose set beforehand, that is the verification of the initial hypothesis (Tsoumpri, 2019): is it possible to train new designers who are able to provide the whole process, making conscious use of related skills, digital fabrication tools, verification and multidisciplinary validation tools, at a local level but always in connection with the global network?

The design experiment led to define the acquisition of specific skills and experiences provided in order to make the young designer able to develop such a complex device.

Before delving deeper into the design process, it is necessary to understand what the methodological process followed was and in particular who are the actors that influenced it. The project revolves around the hypothesis that when dealing with disability-oriented design, structuring it as a linear process, from designer to user, is reductive, if not counterproductive. This is because of the intrinsic diversity of the world of disability, which is therefore complex, if not utopian, to group or define in categories without partially distorting the needs of the individual. To solve this natural criticality in this context, the Maker takes over, helping to define the solution for the individual and through an Open-Source circuit (fundamental in opening a direct modification channel with the peripheral, useful in mitigating the complexity), provides feedback by expanding the gamepad's range of performance. If this process can be assumed to be valid at the moment of commercialisation, it is also valid in defining the interaction with the project and all the development upstream, in creating the right logical process so as not to run into a solution that is too generic, i.e. traditionally industrial, but neither is it too specific and anchored to the end user (in this case Fabio, the project tester). The process is called "two-entry", or more correctly "two-roles". There is an initial phase where a gamepad is designed focusing on providing a set of possibilities derived from the analysis carried out on the scenario (pathologies, symptoms, kinesiology, existing peripherals, etc.), not at all different from the process commonly carried out in didactic exercises where questions hypothesised by a usually wide-ranging scenario are answered. This is followed by a subsequent phase of confrontation with the user, playing the role of Maker where the possibilities offered by the gamepad are used, extending them, modifying them, shaping the solution to meet the needs of the individual (in this case Fabio). This step is made more solid by the simultaneous collaboration with different subjects, between *virtu-aLAB* Polito and *Hackability*. The role of the Maker, interpreted in a temporary key during the confrontation with the end user, is a hybrid designer/producer/intermediate user (intermediate prosumer), since in order to design the final solution, the gamepad itself must be conceived in the beginning for its role of fruition and modification. A useful abstraction to understand these two roles is to imagine them as two separate and distinct persons: a designer endowed with the know-how necessary to design an artefact from scratch, and a Maker endowed with the equipment but not the knowledge necessary to

design the peripheral from scratch, and a boy with a disability (user), who only communicates with the Maker. The designer asks the question “how can I design an inclusive peripheral that can respond to a range of hypothesised scenarios? That is also accessible to the Maker to modify it with his tools?” The Maker in turn asks “How can I modify this component to meet the needs of the user? What should I report as a criticality of the peripheral to the designer?” According to this logical process, general needs arise first, into which the needs of the individual (Fabio) are then inserted. The world of video games is vast and complex, so also the end user. He has an active role, he performs a fundamental verification action to effectively respond to the complexity of the two worlds, video games and disability, by determining the times and means necessary to provide feedback. The user’s feedback is not lost the moment it reaches the Maker but is translated into performance and included as a modification in the gamepad circuit. The user in this context is not only the person with a disability but often also his or her support sphere (a counsellor, his or her therapist, etc.) who can contribute fundamental feedback, adding value to the network of competences necessary for the development of a complex project.

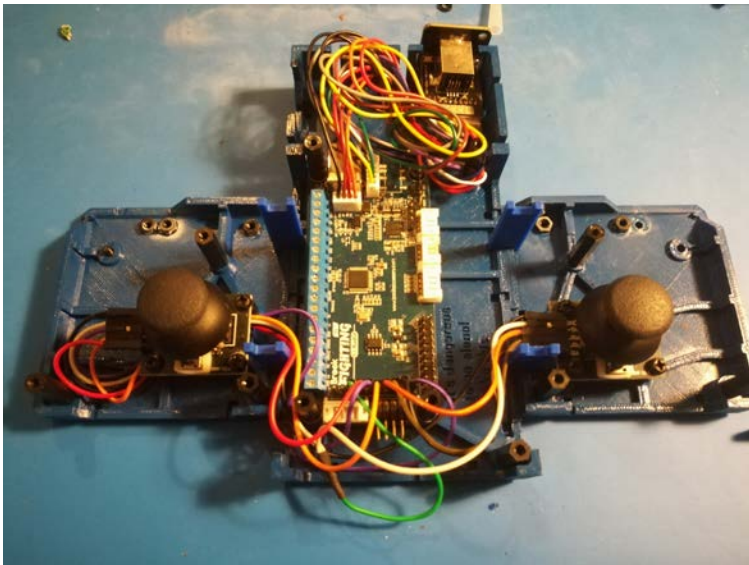


Fig. 2  
Gamelon Pad. Hardware developed, prototyped and tested by Nicola Scalzotto. Photo, by N. Scalzotto.

The results achieved Fig. 2 offer a quite promising picture, certainly returning operational functionality to the subject undergoing experimentation, but above all showing that the student designer has been able to follow the entire path by personally completing every single step of the design, prototype Fig. 3

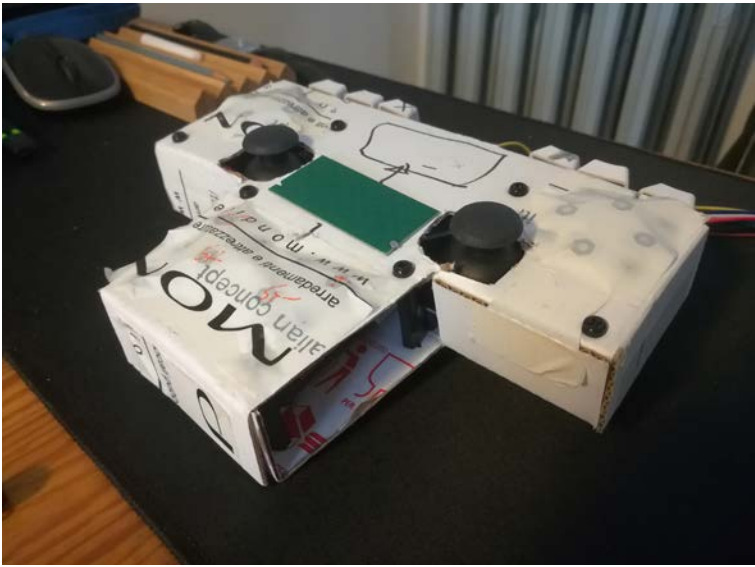


Fig. 3  
Gamelon Pad. The first mock-up used for UX (User Experience) testing. Photo, by N. Scalzotto.

and production journey Fig. 4,



Fig. 4  
Gamelon Pad. First prototype with preliminary buttons layout study. Photo, by N. Scalzotto.

until the delivery of the fully functional device.  
Note that the device is also designed to be adaptable Fig. 5;

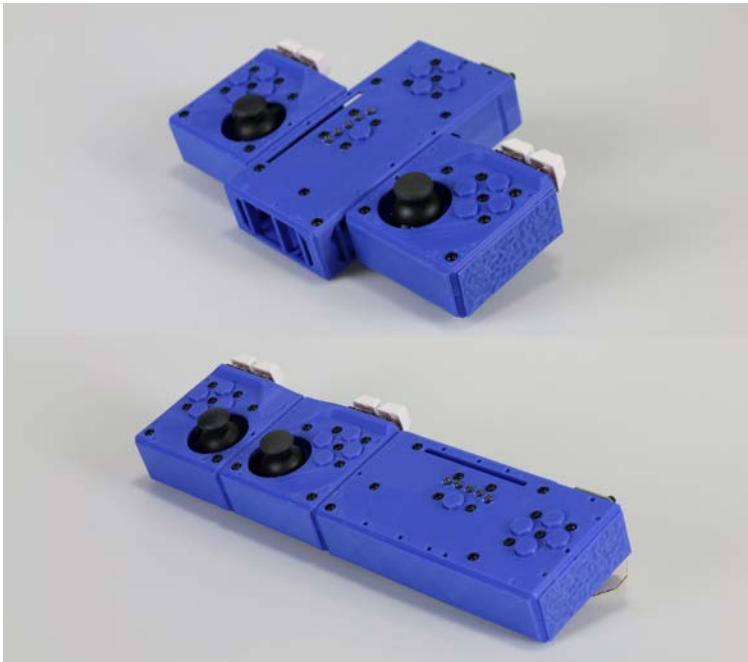


Fig. 5  
Gamelon Pad. The complete device with “T” and linear shape setup. Photo, by N. Scalzotto.

actually, this is not an innovation by itself, except that, being able to operate with digital fabrication at a personal level, such adaptability is feasible locally in time and at costs that amount to a fraction of what they would be with a traditional approach.

The methodology adopted refers to complex processes and networks of values, particularly referring to the aspects of complexity in which “The interest and awareness in the concept of complex thinking as a competency for educational innovation can be considered one of the causes of the recent increase in publications” (Ramírez-Montoya et al., 2022, p.11).

In this regard, we would like to highlight in particular the most relevant keywords that characterised the present work: creative thinking, complex thinking, health epistemology, systemic thinking (Horn et al., 2022), multi-disciplinary, technology integration, and open design.

The most significant result lies in the increased awareness of the student designer (Hays, 2013), who acquired a greater ability to connect heterogeneous cultural values, developing solid guidelines for a coherent design, and finally adopting and integrating different technological solutions, while practicing and verifying them in the lives of the people targeted by the products/services created.



## Conclusions

The Gamelon Pad offered the possibility to test a promising, efficient and effective approach to a multidisciplinary design process starting from the educational experience, since this has been widely identified as the proper place where to introduce innovation to be driven in the future production strategies (Ryan, 1997; Sevaldson, 2013).

In summary, the project offers preliminary evidence of the reasonableness of the starting principle, which sees the learner as a subject involved in complex, interconnected and dynamic processes, but facilitated by advanced and accessible technologies, certainly, but above all by a new way of managing the connections between knowledge, the sharing of skills, the development and production of artefacts and services Fig. 6.



Fig. 6  
Gamelon Pad. Fabio using  
the final prototype. Photo,  
by N. Scalzotto.

What is clear is the radical change in the relationship between objects/people/environment, with obvious advantages for the territorial policies of production, where new principles and practice of Design can regain the values of connection with the human being and the environment that are now considered by many as not questionable.

The project, while approaching certain specific conditions, is to be considered at starting stage; with the appropriate means multiple futures can be envisaged, even not strictly related to the peripheral per se, with the constant technological race of digital manufacturing and the sedimentation of realities more focused on data sharing and production potential: a future full of more accessible peripherals cannot be excluded, not only in the gaming field. The next version for Fabio is currently being assembled, with improvements on weight and usability of the controls. Gamelon Pad will be available on the Hackability portal and major online project sharing sites in the form of instructions and files. Considering how the project is structured we foresee in the future its ascription as a solution focused on economic return or localized, specific small-scale production. Indeed, from the technical point of view, it would be possible to translate Gamelon Pad into a more stable product with just a light adaptation to a more robust, but still flexible digital manufacturing system while possibly expanding it with a set of external buttons and a flight joystick configuration in the near future.

In the didactics of design, especially when deeply connected to research and experimentation, the question that must always be asked is whether the tools provided are capable of withstanding the challenges that will be posed to students, with a perspective, evidently, to doing what is possible to prepare them for the much more complex challenges of the professional market. This approach is therefore to be considered not only didactics, but design itself, considering the perspective whereby the subjects (students) need to satisfy certain fundamental needs (learning experience) while designers (teachers) have the task of providing the solutions. Seen from this point of view, the mode is exquisitely a prerogative of design, which certainly makes design practice one of its fundamental objectives. This approach envisages the identification of solutions that bring about a certain continuity of action over medium to long periods of time, but which in reality, unfortunately, clashes with increasingly rapid, unpredictable innovation processes brought about by a global society that acts globally but affects locally without offering much room for adjustment in the long term. It is therefore a question of devising strategies that are able to look far, geographically and chronologically, but to act close: we can no longer determine our far-reaching choices solely by means of a uniform time scale, as this is either too extensive or too limited. For this reason, in a research field aimed at digital technologies in design, it is necessary to make knowledges transversal, to mix one another and to support subjects so that they share their knowledge, attributing the greatest value not so much to the products of their own ingenuity as to the ingenuity itself. In this sense, the Open-Source approach is promising because it originates precisely from the idea of putting people at the centre, an approach very close to Design but never practised seriously enough to make it unequivocal, inescapable. Certainly, at least in didactics, a subject to put at the centre is already there and it is clear: the student. He/she is the school's cultural target, he/she is young, he/she carries with him the value of the new and of innovation, and he/she will be the next inhabitant of this planet: and if we have not been able to leave it to him/her as he/she deserves, we should at least try to teach him/her not to make our own mistakes while having inhabited the World before.

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Is Design professor at the Politecnico di Torino. He deals with digital innovation and analogical tradition through Open Design, between micro-production and new collaborative methods, through education innovation. He is Scientific director of virtualLAB, member of the ICT board and mentor of the Teaching and Language Lab (TLlab) at Polito.

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The 8th International Forum of Design as a Process, themed “Disrupting Geographies in the Design World” was held in Bologna from 20 to 22 June 2022. The event was organised by the Advanced Design Unit of the Alma Mater Studiorum – Università di Bologna, Department of Architecture, in collaboration with two partner universities: Tecnológico de Monterrey (TEC) and Pontificia Universidad Católica de Chile.

The Forum engaged speakers from the Global Design community, expanding the original vocation of the Latin Network for the Development of Design as a Process to include researchers and designers of the Mediterranean Area, Middle East, IOR (Indian Ocean Region), and Global South regions. The goal was to share new perspectives on imagining design futures in a responsible and just perspective, at the forefront of change, while building strategic partnerships and creating accessible knowledge.

Structured around three pillars — seminars, workshops, and exhibitions — the Forum hosted meetings, reflection opportunities, networking activities. It involved designers, scholars, young researchers, design entrepreneurs, in an experimental format.

Speakers’ contributions not only inspired the practices of the designers’ community, but also resonated with students and the broad audiences. The presentations explored intersections of materiality and culture, post-coloniality, decoloniality, gender studies, and other areas of human thought and action which seek to analyse, question and challenge the disruptive geographies in the world, today.

The papers submitted to the five tracks proposed are published in the Digital Special Issue 1 of *diid. disegno industriale – industrial design*, celebrating during those days its 20<sup>th</sup> anniversary and serving as the fourth partner of the event.

## The Editors

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