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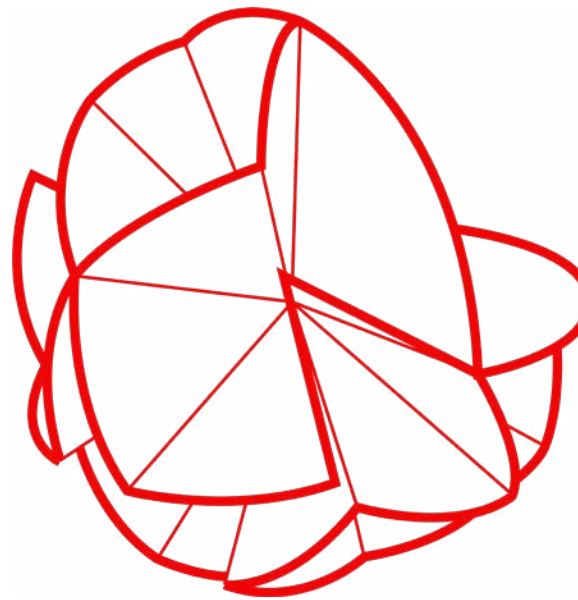
Disrupting Geographies in the Design World

Proceedings of the 8th International Forum of Design as a Process

Alma Mater Studiorum — Università di Bologna



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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

Design, Art, Craft: Cross-fertilizations and Experiences
2nd Edition
Universidade de Aveiro, Aveiro, Portugal
October 28-30, 2010

Innovation in Design Education
3rd Edition
Politecnico di Torino, Torino, Italy
November 3-5, 2011

Diversity: Design/Humanities
4th Edition
Universidade do Estado de Minas Gerais – UEMG, Belo Horizonte, Brazil
September 19-22, 2012

Advanced Design Cultures. The Shapes of the Future as the Front End of Design-Driven Innovation
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/

8th 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

Pontificia Universidad Católica de Chile School of Design

The UC School of Design equips professionals to navigate intricate scenarios, addressing challenges stemming from the ever-evolving landscape of scientific and technological advancements and the socioeconomic and cultural intricacies of the contemporary world. Rooted in the ethical principles of the University, this educational endeavour places particular emphasis on fostering creative intelligence, nurturing critical thinking, and cultivating social sensitivity.

www.diseno.uc.cl

diid disegno industriale industrial design

diid is an open-access, peer-reviewed scientific design journal published three times a year. It was founded in 2002 to fill a gap concerning scientific journals in Italy related to industrial design and design studies. Over the last two decades, *diid* has investigated design disciplines and practices, recording their development thanks to the significant contribution of Italian and international scientific communities. The one inaugurated in 2021, with issue no. 73, is a new phase. The journal, while exploring advanced design cultures, delves into specific aspects such as anticipation, narratives of complex systems belonging to the evolving landscape of capitalism and relational dynamics, the front-end of innovation, the avant-garde of theoretical and applied design debates. The pivotal theme under the lens of analysis is transformation, aiming to comprehend its various impacts and meanings within the realms of innovation domains. With this approach, it aims at overpassing spatial, cultural, economic, and technological boundaries giving voice to design research coming from different areas.

https://www.diid.it/diid/index.php/diid

8th 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

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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Disrupting Geographies in the Design World

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138 Long Abstracts Submitted

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150 Participants

17 Ph.D. Students and Research Fellow Involved

13 Master and Bachelor Degree Students Involved

13 National and International Students Involved in the Workshop “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

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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.

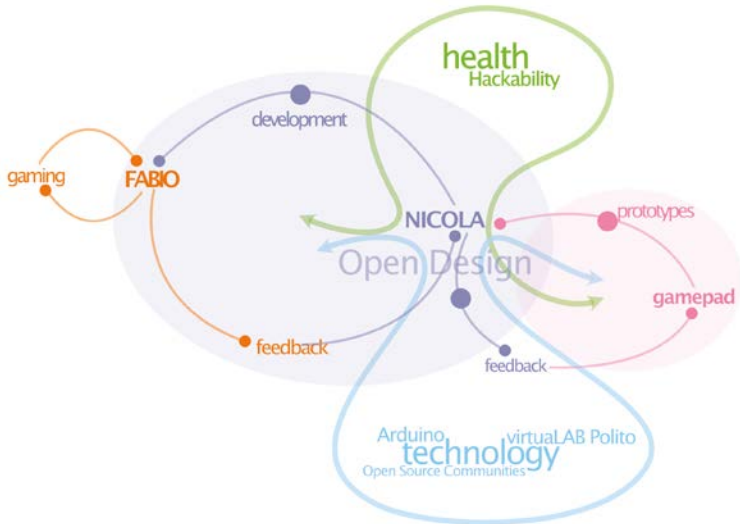

Fig. 1
Gamelon Pad. Methodology scheme with Design process and disciplines. Scheme, by F. Valpreda, N. Scalzotto.

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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 virtuaLAB 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.

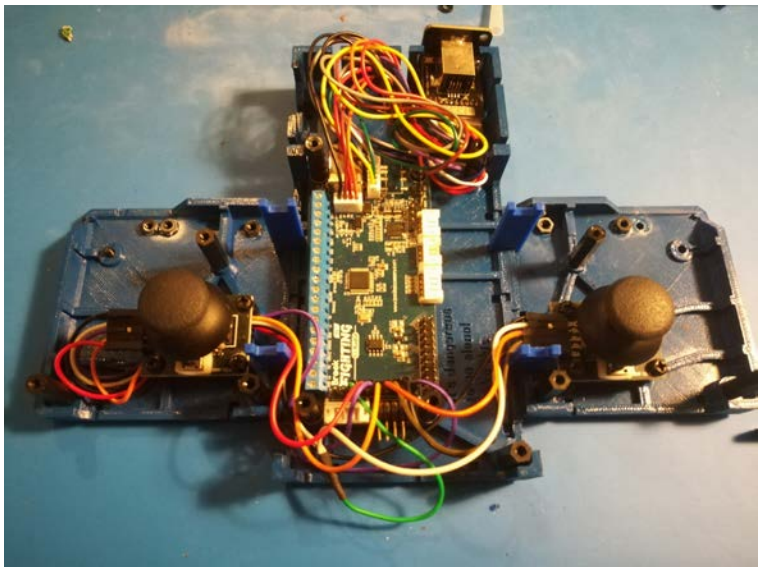

Fig. 2
Gamelon Pad. Hardware developed, prototyped and tested by Nicola Scalzotto. Photo, by N. Scalzotto.

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

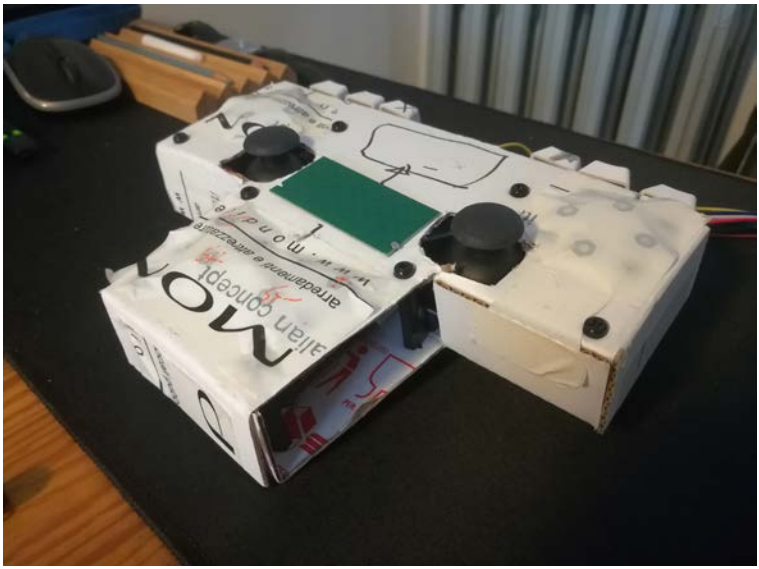

Fig. 3
Gamelon Pad. The first mock-up used for UX (User Experience) testing. Photo, by N. Scalzotto.

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;

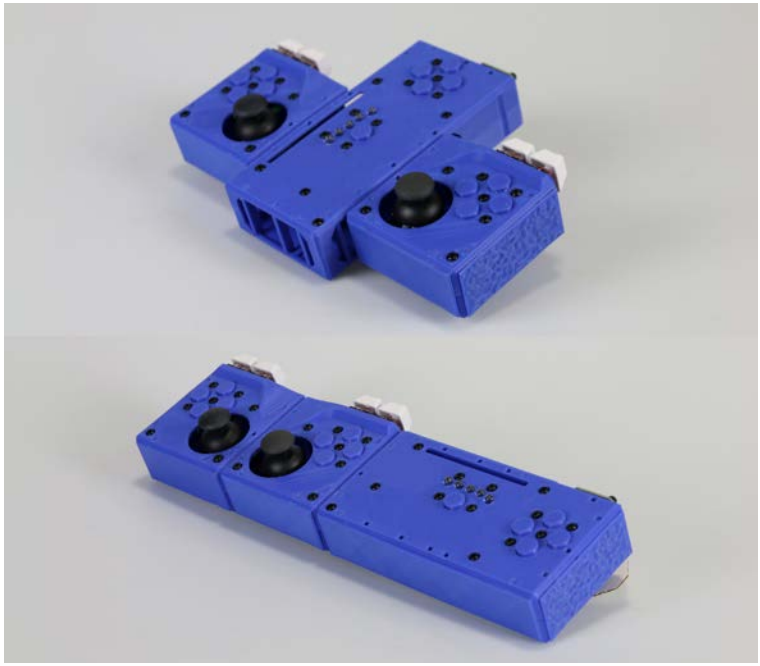

Fig. 5
Gamelon Pad. The complete device with “T” and linear shape setup. Photo, by N. Scalzotto.

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 virtuaLAB, 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 20th anniversary and serving as the fourth partner of the event.

The Editors
Erik Ciravegna, Elena Formia, Valentina Gianfrate, Andreas Sicklinger, Michele Zannoni

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