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Designing Design Education. An articulated programme of collective open design activities

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Abstract: Design Education is changing. Setting out from the awareness that “the profile of design professions need not – and should not – remain what it is today” (Findeli, 2001, p.17) and from insight suggesting that the “experimental approach will become the “normal” approach in our future” (Manzini, 2015, p.54), the authors worked on an articulated programme of collective open design activities reflecting these changes. The activities focus on concrete experimentation on the paradigm of distributed production, which modifies the articulation of known roles and the traditional design education approaches. Therefore, the initiative aims at involving important international design schools in a concrete design exploration of this key issue for society and the design discipline itself. Manzini (2015) urged to “look at the whole of society as a huge laboratory of sociotechnical experimentation”: this practice is a remarkable example which may be used as a model in the future on a larger scale.

Keywords: Design Education, Maker Movement, Fab Lab, Fab City

1. Framework

1.1 The world is changing

The world is changing, and it is changing fast within a liquid society (Bauman, 2000). Globalization has permeated all human systems, from fashion to eating habits, from health to economy, from technology to education. All these systems are interconnected on a global scale, thanks to growing exchange flows which have sped up following the Third and Fourth Industrial Revolutions.

The Third Industrial Revolution spawned and allowed for the development of electronics and information technology; these were instrumental for the occurrence of the Fourth Industrial Revolution, which revolves around smart manufacturing and maker movement. Digital platforms and distributed production are becoming more and more accessible and affordable. They generate a socio-economic shift by changing processes, know-how and involved actors in designing, producing and distributing contemporary artefacts.

“Modes of production shifted from pre-industrial extraction to industrial fabrication to post-industrial processing and information technologies.” (Friedman, 2012, p.139)

The centre of this socio-economic shift is the city transforming into a *metropolis* due to rampant population growth. The city is not just an attractive centre, but it is becoming a hub within the global system (Fiorani, 2012). This means that new social and economic hierarchies emerge within the reticular, transcalable city which assigns new meanings to its spaces.

1.2 Fab Cities

The socio-economic shift opens up a new city scenario – named “Fab City” – first developed by the makers of the Institute for Advanced Architecture of Catalonia (IAAC), the MIT’s Center for Bits and Atoms and the Fab Foundation.

Fab City (<https://blog.fab.city/@fabcity>) is a new urban model for locally productive and globally connected self-sufficient cities. Cities will source and use materials from “Products In Trash Out” (PITO) to “Data In Data Out” (DIDO): this means that more production occurs inside the city, along with recycling materials and meeting local needs through local resources. The currency would mostly be open-source data, which citizens can use to shape a more resilient city, thus creating a greener model thanks to a drastic decrease in used materials and related energy consumption. In order to make this happen, cooperation among cities, citizens, organizations, and knowledge centres is fundamental.

The Fab City Initiative established that “the main principles for designing in and for a Fab City are:

- design for liquid times
- design products with an urban strategy
- design interventions for constructive activism” (<https://blog.fab.city/@fabcity>)

Within this scenario “new approaches and technological solutions have been developed, including:

- manufacturing locally, and creating global impact
 - distributed energy production
 - cryptocurrency for a new economy
 - food production and urban permaculture
 - educating for the future
 - building the future circular economy
 - collaboration between governments and the civil society.
- (<https://blog.fab.city/@fabcity>)

All these initiatives are supported by digital manufacturing technologies, smart energy networks, intelligent infrastructure, new mobility models, and their related policies and regulatory approaches.

Fiorani (2012) explains that the reticular, multi-centred city is fragmented in material and immaterial places inhabited by communities. Fab Cities experience the action of creative communities, composed by distinct but not distant persons, “community both in terms of the group that supports, shares and recognises the value of their actions, and in terms of the sense of togetherness they pursue”. (Meroni, 2007, p.9)

What would happen if a community composed solely by creative types designed for and in a Fab City? How can designers be prepared to design within this framework?

1.3 Design education

The current skills and attitudes of young people do not fit the role required by their work, as their educational curricula are not up to the challenges faced in the contemporary world.

The world of today is different from the one in which design was born: complexity has grown exponentially and the elements to take into account are many and mutually linked. It is clear that design is focusing less on material systems—systems of “things”— and more on human systems (Buchanan, 2001, p.12). The design activity does not concern only material artefacts: owning social science, storytelling and interaction skills is paramount. Young people’s current sets of skills and attitudes are a weak match for the requirements of their work.

New kinds of designers will be needed, with new knowledge, skills, and attitudes (Valtonen, 2016). “The profile of design professions need not – and should not – remain what it is today” (Findeli, 2001, p.17). Designers must be capable of managing complex and innovative processes involving science, technology, society, business models, marketing, and political issues. They should possess trans-disciplinary knowledge and synthesize it in their projects.

The new processes and technologies of the Fourth Industrial Revolution need people capable of designing new tools, their physical and digital interfaces, their interaction with people.

In order to keep up with a fast-changing world, design education is remodelling itself.

The current educational model used in the design field originated during the First Industrial Revolution, referring to its societal structures. The division of labour and industrial manufacturing made it possible to see design as a separate activity to production and to have specialist designers (Forty, 1986, p.29). “Currently universities are largely educating designers in similar ways as they have done in the past decades (if not almost a century)” (Valtonen, 2016). The most overused model for teaching in design is the Bauhaus model, which includes a “threefold articulation of art, science, and technology” (Findeli, 2001, p.7).

“Classical industrial design is a form of applied art, requiring deep knowledge of forms and materials and skills in sketching, drawing, and rendering.” (Norman, 2014).

Design education models have trained designers capable of dealing with the classical industrial design issues.

How can new professionals be trained? How to change this design education model? Gibbons (1999) has identified two different approaches: the first, which he calls “Mode 1”, is the most traditional way to change a university – by introducing new knowledge through disciplinary research (Gibbons, 1999, p.23). Thanks to research, the stock of specialized knowledge grows and, over time, transforms the content of the university curricula, altering what is considered as essential. This approach is specialist-research-driven and today it co-exists with what Gibbons refers to as “Mode 2”. Valtonen (2016) sums up well the five attributes of the latter:

- “knowledge is produced in the context of application, rather than within specialized areas of academia
- it is often trans-disciplinary
- knowledge production demands varied skills; problem-solving teams are hence often heterogeneous and organizationally diverse
- social accountability and reflexivity increase

- quality control of academic output no longer comes from the metrics of academia alone, but includes a broad range of intellectual interests as well as social, political and economic relevance”.

Mode 1 is still the most common approach in universities, but Mode 2 is starting to emerge through informal learning. Contrary to the past century, people learn more through a hands-on, experimental approach than in class.

Informal learning is more and more widespread. People are more engaged if they use a learning-by-doing approach, which makes them more active and empowered, while taking more risks by using an experimental approach and trying to find the solution for their current need. The change that is occurring in the learning community started out with changes in informal learning inside our cities. “Experimental approach will become the “normal” approach in our future” (Manzini, 2015, p.54).

The Maker movement turns the whole “city into a learning community, one where parents, educators, and students come together to reshape learning around the needs of learners” (Hirshberg, Dougherty & Kadanoff, 2016). Marshall McLuhan in 1967 argued that the “information level outside the school room is far higher than the information level inside the school room”. He highlighted the need to shift “stencilled instruction to discovery, probing and exploration”. How do we make design education more engaging, more relevant, and more collaborative? How do we train our young designers in a more integrated way?

1.4 XXI Triennale International Exhibition 2016

The authors tried to imagine a new format to deliver design education to young designers, specifically referring to informal learning within Fab Cities. In a Fab City, ideas were explored and tested, leading to the implementation of the format for a new experimental way to deliver design education, and thus Design Now was born. The right opportunity came around with the XXI International Exhibition of the Triennale di Milano, Italy (XXIT).

XXIT was an articulated programme of exhibitions, events, calls, festivals and conferences held all over the city of Milan and involving museums, universities, the former EXPO 2015 area, art academies, and new spaces for culture and creativity. The theme of the XXIT was “21st Century. Design After Design”, regarding the ability of design to relate to contemporary issues such as the impact of globalization on society, the transformations resulting from the 2008 economic crisis, the relationship between design and city, and the connections between design, new technologies, and craftsmanship.

This appeared to be the perfect opportunity to prototype the new format.

2. Goals

Design Now (<http://design-now.org>) is a programme of collective open design activities.

One of its purposes is the experimentation of a new training method for young designers; the programme, promoted by *School of Design* at the *Politecnico di Milano* and *Consortium POLI.design*, is a first experimental attempt to bring together young designers and make them come into contact with new knowledge, skills, and attitudes.

This new method engages with the shift happening in society and economy: this is why it is based on concrete experimentation, made possible thanks to the support of *Polifactory*, *Politecnico di Milano's Makerspace*, and the collaboration of *IAAC-Fablab Barcelona* and *Fab City Research Laboratory*. This collaboration may lead to other similar experiences in the future.

The programme was realised in a partnership with *Triennale di Milano* and was included in the XXIT's

calendar. Since XXIT's aim was to engage and connect with an audience of young attendees and designers within an international context, another purpose of the initiative is to involve the most important Italian and international design schools in a practical design exploration of XXIT's key-theme, as it is important for society as well as the design discipline itself. Internationalization is an essential goal of the initiative: today, education is diffused and people study all over the world, making use of digital tools and getting in touch with new contexts and cultures by travelling. The patronage of *Cumulus International Association* – the most important worldwide network of Schools of Design, Arts and Media, comprising over 250 institutions – helped spreading the initiative globally.

3. Method

Design Now was a programme of collective open designing activities that met all the aforementioned objectives.

The programme included the following planned activities:

- **launch** of the initiative
- an **Ideas Jam** - “When production goes into the city”
- an **international call** for participants to design now summer school
- a **summer school** - “Fab City: designing products and services for urban resilience through manufacturing”

All these activities culminated in the organization of two closing Exhibitions.

3.1 Launch of the initiative

Design Now was launched through a set of activities in April 2016. The first was organized at Polifactory and was addressed to *milanese* design students. Activities were introduced by Luisa Collina – Dean of the School of Design of Politecnico di Milano and President of Cumulus International Association – during the Cumulus Association's conference at Nottingham Trent University. At the same time, Stefano Maffei – Associate Professor of Politecnico di Milano and Head of Polifactory – introduced the activities during the seminar “Labour vs. Labour”, a convention featured among the collateral events of the New Craft Exhibition, organized by FGB and part of the calendar of the XXIT.

3.2 “When production goes into the city” Ideas Jam

Jams are intensive design-led workshops whose aim is to explore and analyse complex ecosystems by building on each others' ideas in order to discover and prototype innovative solutions. The tools used in a Jam are those of Service Design (Thinking).

“When Production goes into the city” was a Jam that took place in late May 2016, focusing on the relationship between service design and the new models of production-distribution. Managed and organized by Paco Design, the Jam took place simultaneously in seven different locations around the world:

- Milan (Italy) at Polifactory, Politecnico di Milano
- Pamplona (Spain) at Fab Lab Coworking
- Madeira (Portugal) at Universidade da Madeira
- Pune (India) at DSK International Campus
- Medellin (Colombia) at Universidad Pontificia Bolivariana with the support of Designit

- Cape Town (South Africa) at Cape Peninsula University of Technology
- Leeds (UK) at School of Design, University of Leeds.

Each site selected one or two “Jammers”, granting them direct access to the Summer School powered by the School of Design at Politecnico di Milano that took place in July in Milan, Italy.

The Jam reached out to all open-minded students in the different disciplines of Design, Engineering and Architecture, including new graduates (within two years of earning the degree).



Figure 1. Participants and tutors at the end of the “When Production goes into the city” Jam at Politecnico di Milano, Italy.

3.3 International call

An international call for participants was launched in April 2016 during the Milan Design Week with the patronage of Cumulus International Association. Its aim was the selection of talents that would take part with innovative ideas and experiences to the Summer School regarding urban resilience and manufacturing, taking place at Politecnico di Milano’s School of Design and Polifactory in July. The form was uploaded online; applicants had to submit their CV, portfolio and a motivational item (to be chosen between a video, a poster, or a motivational letter).

Similarly to the application for the Jam, the call was open to all students in different disciplines, including both current students and new graduates (within two years of earning the degree). In order to support people coming from different parts of Italy and from abroad, fourteen scholarships were offered.

The call was promoted through newsletters, Facebook events, digital platforms, and flyers.

The call closed at the end of May and the applications were then reviewed by a scientific committee formed by:

- Luisa Collina, School of Design, Politecnico di Milano
- Giulio Iacchetti, industrial designer
- Susanna Legrenzi, Innovation Design curator and journalist
- Stefano Maffei, Director, Polifactory, Politecnico di Milano
- Stefano Micelli, Ca ' Foscari University, Venice, and scientific director of the Northeast Foundation,
- Ivana Pais, Università Cattolica, Milano
- Fabrizio M. Pierandrei, Politecnico di Milano and PACO Design Collaborative founder.

Thirty people were selected for the following Summer School.

3.4 Summer school: “Fab City: designing products and services for urban resilience through manufacturing”

The Summer School revolved around the theme of urban resilience through distributed manufacturing in Fab Cities. It was organized by Tomas Diez and Massimo Menichinelli from IAAC-Fablab Barcelona and Fab City Research Laboratory. James Tooze, Royal College of Art, London, was invited as a mentor and lecturer.

The Summer School took place at Politecnico di Milano’s School of Design and Polifactory in July 2016. The 40 participants were selected through two channels: 10 from the Jams that took place in different international schools and the remaining 30 through the international call.



Figure 2. Opening of the Summer School at Polifactory.

The programme included a mid-week public event (“Milan: a new industrial, creative and collaborative city... now also a Fab City?”) (Figure 3), excursions around the city of Milan (Figure 4), its Fab Labs and Makerspaces (Figure 5), and lectures. However, most of the time was dedicated to developing the brief and group designing activities (Figure 6), counting on the support of Polifactory’s technologies and experience. All participants were required to use digital fabrication technologies for the projects and related interactive exhibitions. The projects were to provide an answer to the challenge of how to transform a city into a Fab City according to specific new policies. The Summer School’s output included products, services or product-service systems.



Figure 3. “Milan: a new industrial, creative and collaborative city... now also a Fab City?” public event.



Figure 4. Summer School’s participants visiting XX1T’s exhibition “New Craft” at Fabbrica del Vapore in Milan.

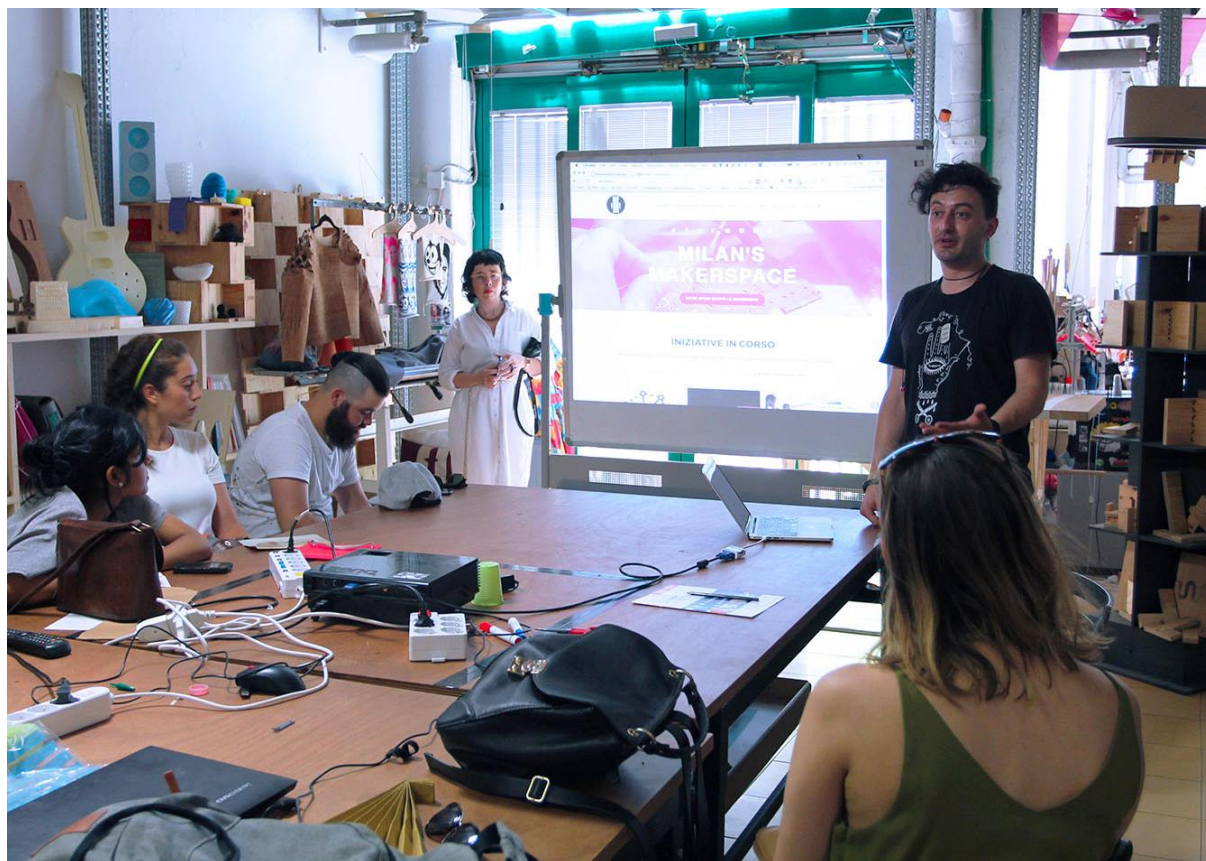


Figure 5. Summer School's participants visiting !We Make! Makerspace in Milan.



Figure 6. Summer School's participants working in group in Polifactory.

Throughout all the activities, emphasis was put on applying a learning-by-doing approach, internationalization and informal learning. A learning-by-doing approach was necessary since all output from the Jams and Summer School had to be prototypes. These prototypes were completed thanks to the support of Polifactory and other makerspaces around the world (Figure 7).

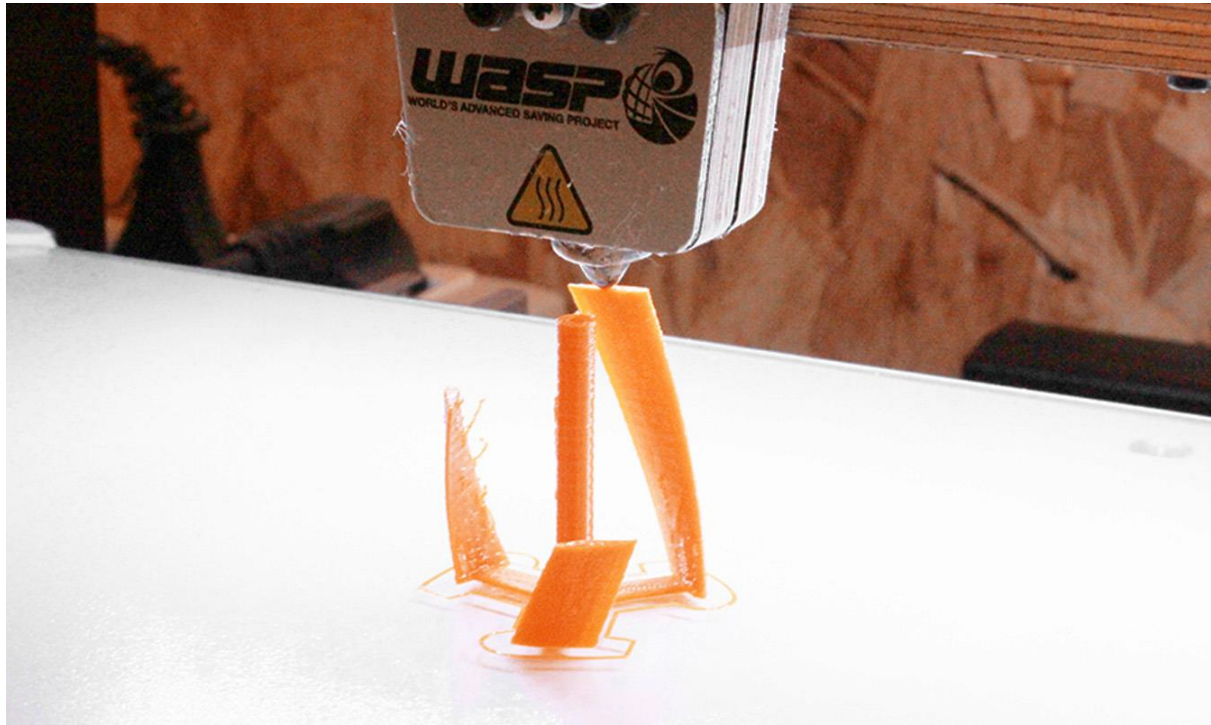


Figure 7. Polifactory's 3D printer making a Summer School's group prototype.

Internationalisation was a core purpose, and was achieved through the following strategies:

- Involvement of many international partners, associations, Fablabs, mentors, and professors
- international offline launch of the initiative
- the Ideas Jam was distributed in seven cities all over the world, which also provided the very first group of international participants selected to travel to Milan
- the Summer School's call for participants was open to all young designers around the world
- in order to support mobility of youths coming from far away countries, scholarships for the Summer School were offered
- the participants worked in mixed groups, creating an international network of people
- the Summer School held a final event in the presence of an international school.

Informal learning was included in the schedule of events. During the Jam, a lot of physical activity was also involved, both inside and outside the venues. Participants danced and performed together as part of team-building activities. The weekend of Summer School was spent visiting Milan's Fablabs, makerspaces and XXIT exhibitions: this allowed the participants – especially internationals – to get a grasp of the ideas brewing in Milan in regards to these themes. During the week, an informal lecture attracting professionals from all around Italy was hosted by Polifactory.

4. Results

Shown below are the numbers of the achieved results in the different designing activities.

Ideas Jam numbers:

- 7 locations around the world
- Cape Town, South Africa: 20 participants, 3 coordinators and 9 facilitators
- Leeds, UK: 4 participants, 1 coordinator and 4 facilitators
- Madeira, Portugal: 10 participants, 1 coordinator and 5 facilitators
- Medellin, Colombia: 10 participants, 1 coordinator and 2 facilitators
- Milan, Italy: 20 participants, 1 coordinator and 7 facilitators
- Pamplona, Spain: 15 participants, 1 coordinator and 3 facilitators
- Pune, India: 11 participants, 1 coordinator and 5 facilitators

For a total of:

- 87 participants
- 9 coordinators
- 35 facilitators
- 10 designers selected for the Summer School.

Summer School numbers:

- 80 people from 22 countries, from all 5 continents, applied to the international call for participants to the Summer School
- among these 80, 30 were selected and 14 received a scholarship
- 40 young people took part in the Summer School: 10 of them were selected through the Jams and the remaining 30 through the international call, with 14 countries represented
- 18 speakers were invited to the Summer School's mid-week public event.

Reach of the initiative numbers:

- about 15.000 people reached through newsletters
- 900 followers on Design Now's Facebook page
- 300 followers on Design Now's Instagram profile



Figure 8. The 35 participants to the Summer School came from 14 countries from all around the world.

During the design process it is important to include a broader audience in the discussion, especially when dealing with themes such as the ones explored during Design Now's activities.

Due to this, all the projects outlines during Design Now were presented in two exhibitions in Milan, which showcased the entire process of this programme of designing activities and the results accomplished by the Summer School. The first was included in the XXIT's calendar and took place at Fabbrica del Vapore in early September (Figure 9). The second was included in the programme of events "Brera Design Days" in occasion of Design City Milano, the Fall edition of the Milan Design Week in October.

The experimental approach employed throughout all activities of Design Now was also used for the exhibition design: the installation was designed and produced by Polifactory, using the technologies inside a Fablab with the same logic adopted in the programme.



Figure 9. Design Now Exhibition at Fabbrica del Vapore showcased all the activities and the designers involved.

5. Discussion

The Design Now experience gave generally positive results, both under the educational point of view and human perspective.

The experience could become a new format or conceptual model translated to a larger scale in the future, involving different Fablabs and design schools and eventually leading to further collaborations. One critical point for the designing activities was the short amount of time given: a solution could be the implementation of longer global Jams happening simultaneously around the world on the same themes. This kind of initiative could help design education in keeping up to date with global trends regarding internationalization, globalization of the curricula, collaboration among universities and Fablabs, offering new knowledge to young people, staying connected with the real world.

This could also bring on entirely different solutions, making use of the ingredients of Design Now.

From a human perspective, the initiative surely created a strong sense of community among the participants, thus creating an international network that will most likely help their connections in the future. Many participants have even visited each other in their home countries and have taken part to other international workshops together.

6. Conclusions

Design Now was certainly an outstanding experience: all the actors taking part in the activities felt highly engaged and involved in a collaborative context. Manzini (2015) encouraged to “look at the whole of society as a huge laboratory of sociotechnical experimentation”: the initiative was a remarkable example of this idea.

Can university curricula keep up with the fast-changing world? How is change designed and carried out? How can we bring together all the actors of this change?

Design Now is our answer, what is yours?

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