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## Proceedings of IASDR 2023: Life-changing Design

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THE 2023

# IASDR Congress

Life-  
changing  
design

Milan 9<sup>th</sup>–13<sup>th</sup> October

PROCEEDINGS OF IASDR 2023

EDITORS:

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Davide Spallazzo



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SCUOLA DEL DESIGN  
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# Life-Changing Design

Proceedings of the 10th Congress of the  
International Association of Societies of  
Design Research (IASDR 2023)

**EDITORS:**

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# The Tenth IASDR congress. An Introductory Address from the IASDR Board

IASDR 2023 is the 10th biennial congress of IASDR, and the first to take place after the crisis of COVID-19. With this congress we re-confirm the importance of discussion and debate for the network of researchers in design, as well as the importance of developing younger researchers for the future of the Association.

The International Association for Societies of Design Research (IASDR) was established in 2005 through a collaboration of four academic societies: Chinese Institute of Design (CID), the Design Research Society (DRS), Korean Society for Design Science (KSDS) and Japanese Society for the Science of Design (JSSD).

The history of international collaboration in Design Research in the Asian region can be traced back to 1996 when JSSD organized the first Japan-China Industrial Design Symposium which was hosted by Beihang University in Beijing, 1996. This started a series of international conferences in design research known as the Asian Design Conference. Conferences took place in 1997 (Daejeon, Korea at KAIST), 1998 (Taichung, Taiwan at National Taichung University of Science and Technology), 1999 (Nagaoka, Japan at Nagaoka University of Technology), 2001 (Seoul by National Seoul University), and 2003 (Tsukuba, Japan at Tsukuba International Congress Center). At the 2003 congress – the 6th Asian Design Conference – the three Asian academic societies agreed to welcome the Design Research Society into a new association.

We thus began the International Association of Societies of Design Research for the field of design research in 2005, in Taiwan. Since that time, we have enhanced the network of researchers and fields of design research and promoted design research education. We will continue to build this incomparable network of design research as we move towards our 2025 congress, at Tapei, Taiwan.

Our deepest thanks go to Luisa Collina, and the entire Politecnico Milano team who have worked so hard, as hosts for IASDR2023, to ensure its success. Your leadership throughout the process has been excellent and we think the result will be much appreciated by the IASDR design research community.

Toshimasa Yamanaka  
President

On behalf of the IASDR Board  
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Fong-Gong Wu  
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# Life-Changing Design.

## Introduction to the Tenth IASDR congress

The International Association of Societies of Design Research (IASDR) has long been at the forefront of advancing design research, providing an international platform for researchers, scholars, and practitioners to engage in robust discussions, share insights, and explore the ever-evolving landscape of design research. IASDR 2023, the association's 10th Congress, stands as a pivotal juncture in the trajectory of design research, offering a comprehensive perspective on its current state while charting its future directions.

Over the past decade, design research has witnessed a remarkable transformation. From its roots in aesthetic considerations and form-centric approaches, design research has evolved into a multifaceted discipline, extending its influence beyond traditional boundaries. Contemporary design literature now encompasses a wide array of facets, each addressing critical aspects of design's impact on diverse domains, including organisational culture, public policies, product development, and the creation of immersive spaces, services and systems. This transformation underscores the dynamic nature of design research, as it continuously adapts to our society's changing demands and challenges.

The central theme of IASDR 2023, "Life-Changing Design", resonates profoundly in the wake of global events, particularly the unprecedented disruptions caused by the COVID-19 pandemic. This theme invites us to reflect on the profound transformations that have unfolded and continue to reshape our world. The pandemic has brought to the forefront questions about the role of design in navigating these changes, challenging us to explore how design can facilitate adaptation, resilience, and innovation in a rapidly changing world.

IASDR 2023 has been organised and host by Politecnico di Milano, where design keeps strong roots in the made in Italy tradition and where at the same time design opens up to the new territories of design research and to the new trajectories of innovation.

IASDR 2023 encompasses an array of thematic tracks, each dedicated to exploring critical dimensions of design research. These tracks serve as focal points for discussions and investigations, providing a framework for researchers to delve into specific areas of interest.

The following thematic tracks guide our exploration:

### **[Changing] Organizations and Policies**

This track examines the transformative potential of design in the realm of public sector organisations and policies. It aims to foster social justice and sustainability by challenging traditional notions of prosperity. Researchers investigate how design equips itself with tools, methods, and frameworks to support systemic transformation, thereby promoting well-being and addressing complex societal challenges.

### **[Changing] Products and Production**

This track focuses on the transformation of manufacturing processes and their impact on products and



systems. It explores the proliferation of digital fabrication and digital craft, analysing their potential to revolutionise product development, sustainability, and business models. Researchers delve into how design can envision emerging materials, artefacts, and future scenarios from a sustainable perspective.

### **Identities and [Changing] Identities**

Cultural identities and their evolution in an increasingly multicultural world take center stage in this track. Researchers delve into the roots of design's influence on identity, considering factors such as authorial identities, identity hegemony, and the implications of design on gender, class, and religion. Additionally, this track explores the role of design in translation processes, which involve revising systems, tools, and programs for communicating and preserving identity.

### **[Changing] Ecosystems**

Addressing the imperative transition toward sustainability, this track examines how design contributes to the socio-ethical and economic dimensions of sustainability. It explores design for sustainable materials, energy, business models, and transitions, focusing on fostering positive environmental and social change.

### **[Changing] Communities**

Community empowerment and sustainable behavioural change through design interventions are central to this track. Researchers investigate how design can enhance collaborative processes, co-design knowledge, and tools while addressing urgent public interest issues. The track emphasises shared decision-making, democratic participation, and the evolving roles of individuals, communities, and entities in supporting systemic transitions.

### **[Changing] Education**

This track reflects on the evolving landscape of design education, recognising the complexities and challenges inherent in this domain. Researchers explore the inspirations for change in design education, the transformations it engenders, and the existing gaps and issues. This track seeks to foster clarity, identity, and adaptability in designing educational goals while embracing diversity and differentiation.

### **[Changing] Spaces and Services**

Integrating spatial and service design to create innovative living environments and services is the central concern of this track. It explores how design interventions across various scales, from micro to macro, can drive transformative actions, enhance public participation, and guarantee inclusivity and diversity in service offerings.

### **[Changing] Interactions**

The dynamic interplay between technology, social changes, and design forms the core of this track. Researchers investigate how digital technologies, augmented reality, virtual reality, and mixed environments impact interactions, communities, processes, and professions. This track emphasises the role of Interaction Design in shaping technology-based innovations responsive to social and contextual changes.

### **[Changing] Heritage**

Preserving and reinterpreting cultural heritage in the face of global change is the central focus of this track. Researchers explore how design research can offer novel approaches to knowledge preservation and cultural experiences related to tangible and intangible heritage. This track seeks to activate participation dynamics that reintegrate relevant portions of cultural heritage excluded from current development paradigms.

IASDR 2023, with its overarching theme of "Life-Changing Design" and its diverse thematic tracks, presents an exceptional opportunity for researchers, scholars, and practitioners to engage with the dynamic landscape of design research. The conference serves as a platform for robust discussions, knowledge sharing, and the exploration of innovative solutions to society's complex challenges.

By examining these thematic tracks and their intersection with the central theme, “Life-Changing Design,” we aim to contribute to the ongoing dialogue surrounding design research and its transformative potential, fostering a deeper understanding of design’s role in shaping our world.

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Alessandro Deserti  
Francesco Zurlo

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Sustainable Tourism Experiences. Designing solutions to improve communities-based tourism services from global to local scale <a href="https://doi.org/10.21606/iasdr.2023.785">https://doi.org/10.21606/iasdr.2023.785</a>	0
Technological mediation analysis on Constructive Design Research: A case study of trust <a href="https://doi.org/10.21606/iasdr.2023.742">https://doi.org/10.21606/iasdr.2023.742</a>	0
The body gets the notion: performative design practice for human computer integration to encourage innovation in the domains of health and well-being <a href="https://doi.org/10.21606/iasdr.2023.667">https://doi.org/10.21606/iasdr.2023.667</a>	0
Tools for opening the lonely black box and changing young adults' perspectives of their loneliness <a href="https://doi.org/10.21606/iasdr.2023.664">https://doi.org/10.21606/iasdr.2023.664</a>	0

Utilizing patent data for enhanced design creativity and reduced fixation in product design  
<https://doi.org/10.21606/iasdr.2023.604>

0

# Fostering collaboration between start-ups and students for mutually beneficial inspiring learning

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[doi.org/10.21606/iasdr.2023.829](https://doi.org/10.21606/iasdr.2023.829)

This two-voiced paper is the result of a student-teacher interaction in which the teacher simply paves the floor for a student's narrative and commentary, from their perspective, of an innovative projectbased studio experience. By partnering with an incubation and start-up program for social innovators in Milan, university faculty considered how to design a studio to stimulate both students and innovators in their different educational and personal trajectories by organising "pairs of teams" with the same design goal(s), conscientious of social innovation, environmental sustainability within a circular economy, and striving for radical solutions. The team for which this student-author is sharing their experience in this paper has been paired with the start-up team "NoLo Ricicla - ilVespaio", whose innovation idea was based on the question "How could a system of plastic packaging recovery, production and distribution of recycled artefacts be organised on a neighbourhood scale in the neighbourhood of NoLo?"

**Keywords:** *education methods; pedagogy; collaboration in education; educational paradigm*

This two-voiced paper is the result of a student-teacher interaction in which the teacher simply paves the floor for a student's narrative and commentary, from their perspective, of an innovative project-based studio experience.

## 1 Introduction [professor]

### 1.1 Designing design education to radically transform outcomes

Over the last decade, education to designing has become more and more key to several kinds of professionals, much beyond those intended to be designers-by-training. The specific territory of incubation of new ventures is one field where design education widely integrated into the training programs of the innovators, particularly with the methods and tools of service design, strategic design and system design, and within a generic framework of "design thinking" (Cautela et al, 2015; Meroni et al, 2017).



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In parallel, formal education for master level design students has generally evolved toward providing more systemic perspectives to specific design fields (Redström, 2020)). This is particularly the case for product service system design students (namely the Master of Science in Product Service System Design of the School of Design of Politecnico di Milano) which, in the Final Synthesis Design Studio of their master career (which goes most in-depth into the subject and with a wider multidisciplinary perspective) are guided into a journey that simulates the development of a systemic idea, from its conception to its pre-prototyping, through a co-design approach on-field.

Given the opportunity of a research project in which design researchers are asked to contribute to design, implement and run an incubation and start-up program for social innovators (namely the Scuola dei Quartieri – School of Neighborhoods, by the Municipality of Milano), the possibility to experiment with a combination of the two education programs (for the students and for the innovators) naturally emerged. As a team of teachers in charge of both, we asked ourselves what if we would have combined the programs into an innovative approach, so integrating education and research.

Both had the goal to provide society with responsible, knowledgeable, and skilled professionals that could help people, organizations or institutions better face the complexity of today societal challenges.

On the one side, thus, we started to consider how to design a studio that could have stimulated both students and innovators in their different educational and personal trajectories. On the other, we started to theoretically frame the topic of the studio, so to be consistent with the objective of producing ideas with a high potential of producing positive social and environmental impact.

## **1.2 An innovative project-based studio**

For the first aim, designing an innovative project-based studio, we leveraged the idea of mutual stimulus between the teams of students and of innovators through emulation around common complex challenges, tackled through a speculative experimentation. Paraphrasing the words of Redström (2020) we shaped the methodology of the studio on the willingness to question what making things is all about: rather than assuming a conventional program solely based on tools and methods to be the best to train students and innovators, we assumed that an interaction between the two groups in form of a mutual inspiration could be more stimulating and pedagogical. With this in mind, we shaped the studio as several “pairs of teams” (students and innovators) around a shared topic, which was defined by the idea of the innovators of the Scuola dei Quartieri. Since there was a temporal coincidence of the idea development phase between the university studio and the start-up incubation program, we thought that the respective work of the teams could have been of mutual inspiration and benefit. Therefore, we engaged the prospective innovators teams in the Final Synthesis Design Studio yet leaving a great freedom of interaction with the students: we asked the formers to be available, at least, to share with the students their initial entrepreneurial vision and to look for the final student work. Then, we leave them the decision of interacting and eventually codesigning during their different journeys (for a period of around 3 months).

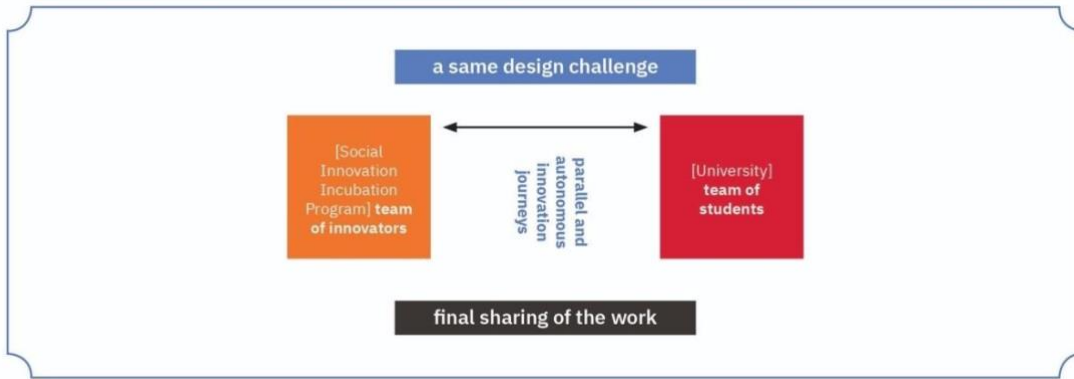


Figure 1. Final Synthesis Design Studio (M.Sc Polimi) Course Structure

We assumed this could be a way to gently nudge each other to experiment. The team of students that are presenting their experience in this paper have been paired with the team “NoLo Ricicla - ilVespaio”, whose innovation idea was based on the question “How could a system of plastic packaging recovery, production and distribution of recycled artefacts be organised on a neighbourhood scale in the neighborhood of Nolo?”.

### 1.3 A theoretical frame of the topic

For the second aim, theoretically framing the topic of the studio so to conceive and develop socially and environmentally positive ideas, we wanted to push the creativity at the edge of sustainability, trying out to design something radically transformative in terms of both circular economy and social sustainability. We aimed to steer creativity, innovativeness and outstanding sustainability attributes by proposing an approach aimed at “radical transformations” and inspired by Victor Papanek’s convincements (Papanek, 1971) that: i) design can and must become a way in which young people can participate in changing society; ii) design, to be ecologically responsible and socially responsive must be revolutionary and radical, doing the most with the least. In this perspective, we also adopted the United Nation Sustainable Development Goals, and the necessity to achieve them all for our future world to thrive.

From these premises we framed an approach, that we named “radical sustainability”, combining social innovation and circular economy into the common challenge of integrating the principles of both of them in each step of the design development.



Figure 2. Final Synthesis Design Studio (M.Sc Polimi) Theoretical Framework

We assumed social innovation to be focused on changing social practices in order to overcome societal challenges, meeting social demands and exploring different ways of doing things, while creating social relations and public value. It often implies collaborative processes, participatory thinking and experimentation (Meroni 2021)

And we assumed circular economy to be set of strategies contributing, directly or indirectly, to increasing resource efficiency and decreasing environmental impacts throughout value chains. A circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. (EC, 2020; EC, 2020a)

Accordingly, over the development of the studio, we provided students with theoretical lectures, tools and method from these two domains of knowledge, social innovation and circular economy.

From this point onward, the student partner is dictating their interpretation and perspective.

## 2 Course methods [student]

Students were walked through the course methods during the first day of lectures, and it will serve as an organization framework for the reflections in this paper.



Figure 3. Final Synthesis Design Studio (M.Sc Polimi) methods

## 3 Methods 01 & 02: team and innovation partner pairing

### 3.1 Team organization

Generating teams is often a point of tension, whether they are organized by students or if faculty retains the judgement of appropriate pairings. To create teams in this course, the faculty circulated a survey which included probes into our pre-masters academic/professional backgrounds, our usual role within team dynamics, our hard/soft skills, and our cultural backgrounds. Our team of three consisted of an Italian student with a background in textiles [Student-A], an Indian student with a background in Architecture [Student-B], and an American student with a background in visual communications [Student-C]. The method for calculating teams according to skill and past experience worked strongly in our favor as the course progressed.

### 3.2 Innovation partner selection

The course centered on partnering student teams with groups from Scuola di Quartieri. Our class was presented with 15 current projects with topics ranging from historical photo archives in Villapizzone [project: Fotoraccordi]; fermenting beverages from locally grown aromatic plants in North Park [project: Fermenta]; empowering young people to build their own instruments to promote a culture of music and craft in Affori [project: Artigiano E Bello – Incubator Per Giovani Liutai]; and others.

Initial reactions within the classroom to this experimental approach were varied. It was inspiring to recognize our course as a tool in itself for developing unique innovation. However, some felt as though our course came into the system as an afterthought; as though our role of being “inspiration” to the existent partner initiatives undermined our contributions to the rank of being mere consideration or fodder for the “real” projects being pushed forward by the city with funding and supportive resources.

Each team was asked to select three projects which interested them, and faculty would decide the final pairings.

### 3.3 team approach to partner selection

To select our three favourites, our team considered that our final S.PSS (Sustainable Product-Service System) would be evaluated on its social innovation, consideration of the circular economy, and radical sustainability. We first expressed our gut reactions to the projects with one another, and from that shortened list we assessed how each project already met our goal criteria by labelling them S (socially sustainable), E (environmentally sustainable), and/or R (radical). We also considered the projects on a neighbourhood scale of practical problem solving to intangible social good.

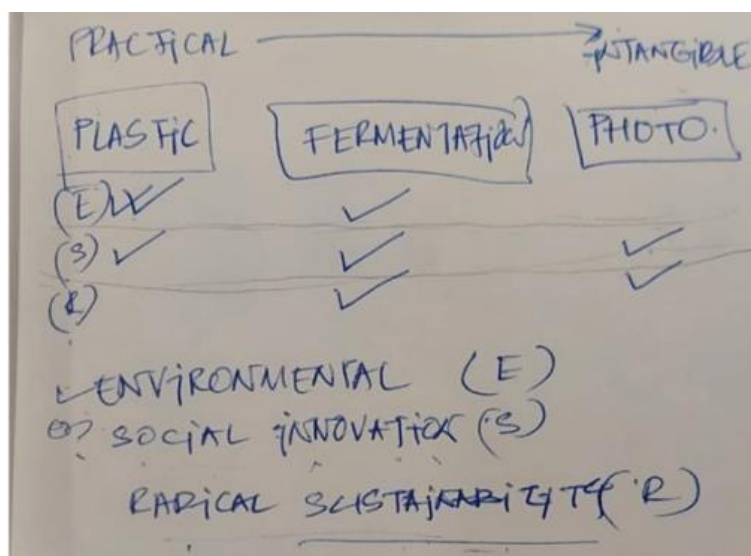


Figure 4. Project ranking



Figure 5. Project ranking + design probe

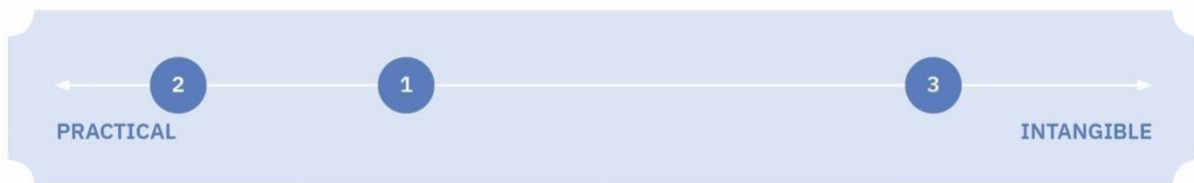


Figure 6. Project ranking on scale of practical problem solving to intangible social good

We were ultimately paired with our second choice, ilVespaio.

## 4 Method 02: project Analysis

### 4.1 Innovation partner: ilVespaio

IlVespaio is a studio based in the Nolo neighborhood of Milan, run by free-lance designers with a focus on ecodesign and sustainability. They are researchers and educators who promote local awareness of social and environmental issues through workshops, events, contests and educational exhibitions. In their own words, “We strongly believe that citizens play a crucial role in the transition towards circular economy and that we need to focus on education especially of children and new generations” (ilVespaio, 2021).

### 4.2 Teammate perspectives after selection

As part of our first deliverable, our team documented any concerns about our partners, hoping to predict future points of difficulty and identify areas we needed to further research.

Student-A’s concern stemmed from the structure of the course itself, intimidated by the simultaneous assessment based on social impact, environmental sustainability, and radical. StudentB’s concern stemmed from scalability, since course expectations mandated that we remain relevant to the neighborhood context. Student-C’s concern was with the prompt, unsure of why plastic *packaging* was specified. There were also positive reactions to our assigned brief. IlVespaio appeared to already involve the circular economy, and social innovation through community in events and workshops, fitting well into the scope of our studio and setting us up for success.



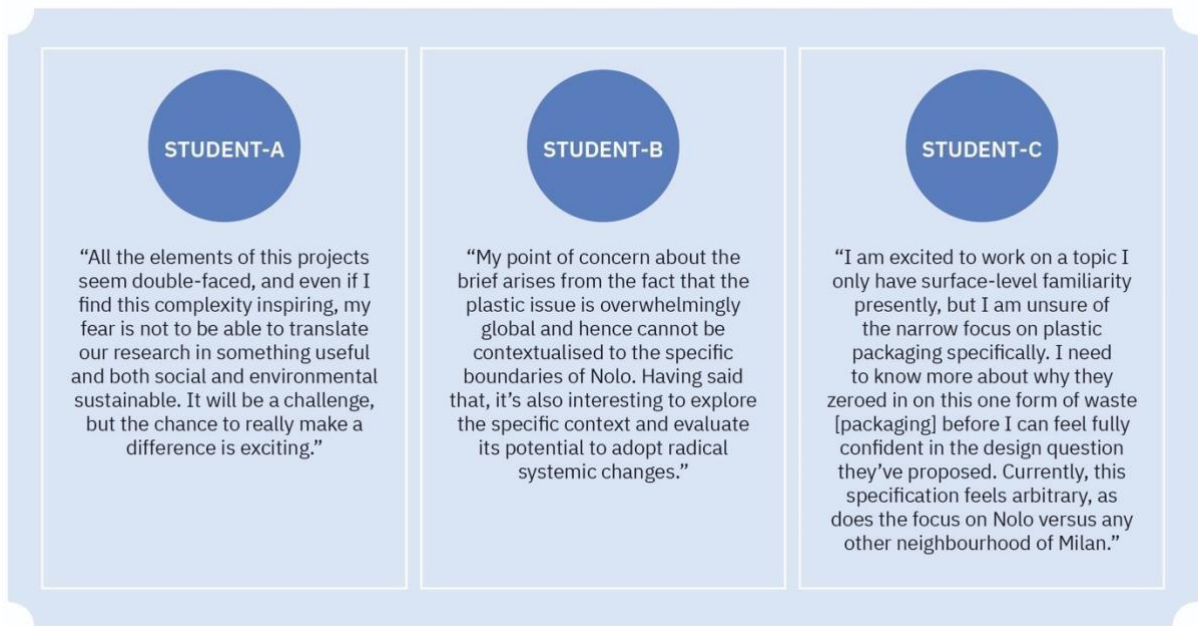


Figure 7. Team reflections in their own words

## 5 Method 02 cont.: research process

### 5.1 Case studies

Preliminary case study analysis either supports, falsifies, or inspires subsequent design choices. We were asked to share a maximum of 15 case studies for the first deliverable, but privately found significance in 40+ others. Our team designed three methodologies for identifying and categorizing useful case studies.



Figure 8. Case Study Approaches

## 5.2 Desk & primary research

Our professors provided three primary research goals: (1) explore the specific topic through desk research, (2) investigate the location through desk and field research, and (3) understand the view of our partner innovators through interviews. We conducted research using internet databases and news outlets, a visit to a Polimi social initiative who aims to strengthen the presence of Polimi across Milan (*Off Campus - Polisocial*, 2023), direct interviews with iVespaio, and multiple trips to the Nolo neighborhood for observational and interactive research with local residents.

### 5.3 Research outcomes



Figure 9. QR Code to Research Outcomes

### 5.4 Teammate perspectives after research

After completing our research objectives, the team once again documented individual POVs.

An infographic consisting of three vertical panels, each representing a student's reflection. Each panel has a blue circular header with the student's name and a light blue background with a white border. The text is in a dark blue font.

**STUDENT-A**

“I must admit that this research brought us in completely unexpected directions. First of all, I didn’t imagine that the “plastic issue” was so complex and tackled at so many different levels: what at first sight seemed a “simple” recycling problem became a discussion around behaviours, social sustainability, growth and natural resources. The possibility to face the problems generated by plastic “waste” are various and different, widening our field of action but also generating doubts. Also, after our interview with “ilVespaio” (the start-up we are matching with), another huge topic entered the scene: education. Personally, I am not excited by this new actor, because it brings a huge complexity and it requires specific competences that do not belong to my main interests, but I will approach this new direction with an open mindset and ready to change my mind. On the contrary, evaluating the effects of gentrification and discussing about what urban degradation means, imagining how the cities of the future could (or should) be is a topic that I like to wonder about, and I believe will be a crucial point in our project.”

**STUDENT-B**

“The promising start to the project has stemmed out of a common drive and emotion we share as a team towards the challenge of plastic pollution. Being able to work with a highly competent team of professionals (ilVespaio) who has dedicated their life’s work towards this cause, has been both an inspiration and as well as a reminder to take action. Moreover, being a part of a team with diverse cultural and professional backgrounds has made the process more engaging, thought provoking and impactful where each of us are always motivated to bring value to the table. I see exciting times ahead!”

**STUDENT-C**

“The task ahead of us is daunting. This research phase has affirmed for me that the topic we’ve ended up with (thanks to ilVespaio) is important and full of potential – but it is intimidating to be working on such a technical material without a science or engineering background. I assume that whatever we work towards will somehow involve a product design as part of our S.PSS, and it’s hard to innovate realistically while still being such a novice to the practical constraints of recycling processes. The education component, on the other hand, feels like a safer realm to me personally as I feel strong in communications... when the language is my native tongue, English. Again, daunting is the word, but there is certainly excitement and curiosity present as well.”

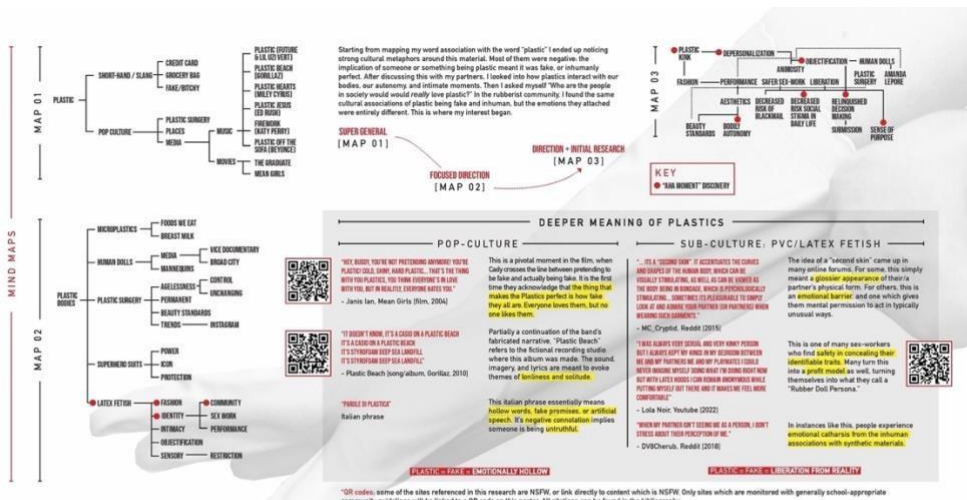
Figure 10. Team reflections in their own words

Student-A's concerns remained around the complexity of the task at hand, but now shifted away from the course structure and onto sustainability. Student-B was entirely positive at this stage, praising the methods and structure not only of the course, but of the PSSD masters as whole for being intentionally intercultural and multidisciplinary when admitting students. As was intended, he felt inspired and moved by our partner innovators. Student-C felt similarly intimidated as Student-A did, but out of a perception of technical inadequacy. The research phase was fruitful, but created as many doubts as it did answered for two out of three teammates.

## **6 Method 03: individual lateral thinking**

### **6.1 Blue-Sky research**

During Method 03, we were tasked with thinking about our topic from an unrelated angle to what we had explored thus-far. We found this alarming at first, because we felt very goal-oriented and stressed by how much was expected to be delivered at the end of the course: spending a week daydreaming about adjacent topics felt like a deviation from our core purpose. Yet in the end, the blue-sky phase was integral to permitting ourselves to loosen up enough to become radical in our solutions. This discomfort was transformative, rather than disruptive or destructive.



# PEOPLE WHO LOVE PLASTIC

## Plastics Subculture: PVC/Latex Fetishism

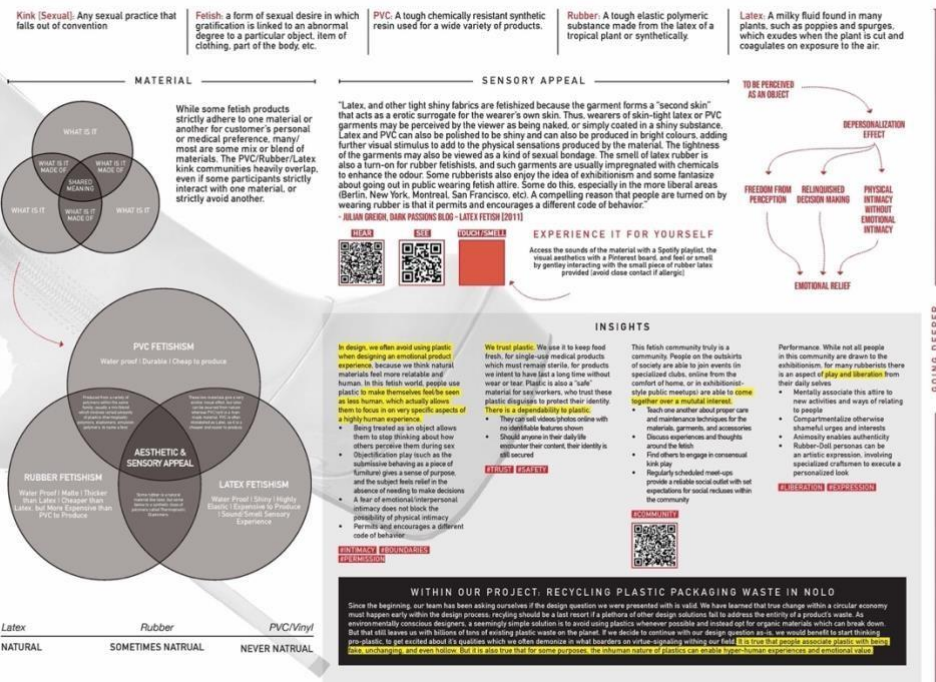


Figure 11. Student-C Blue-Sky Research

## 7 Method 04: co-design process

### 7.1 Co-design building on research outcomes

After the research phase, we built on the environmental plastics problem and paired it with the social challenge of homelessness, which finally tied in our locational context due to the proximity of Nolo (a common gathering space for the Milanese homeless community, already leveraged by existing aid initiatives). Our objective became to design win-win stakeholder interactions by

including homeless people in recycling systems, thereby achieving environmental protection and social inclusion on a neighbourhood scale.

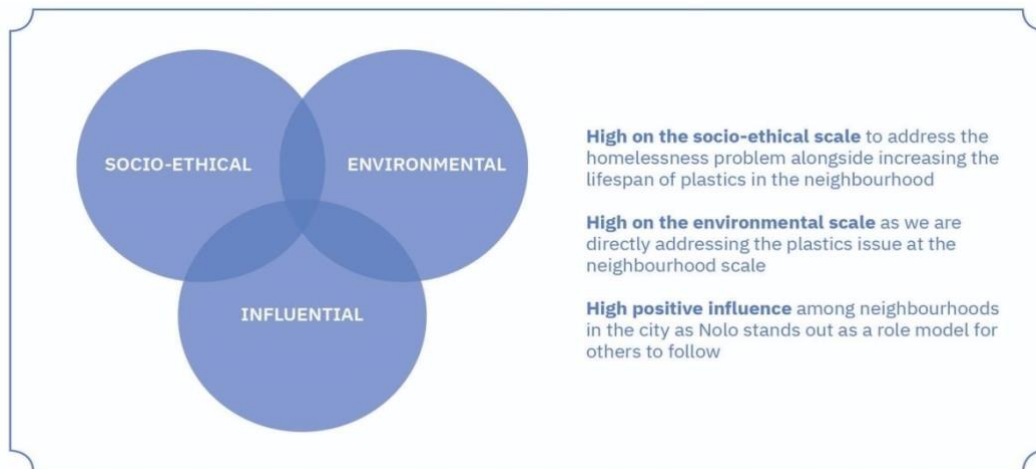


Figure 12. Potential Benefits of the S.PSS

## 7.2 Defining programs & expert categories

We worked as a team to define co-design expert categories: (1) Homelessness Experts; 2) S.PSS Experts; and (3) Materials Experts. We designed the Product Life Cycle + Stakeholders [Diagram] tool for slow co-design sessions with both (1) Homelessness Experts and (2) S.PSS Experts, slightly modifying the tool to accommodate each audience. We made the Materials [Draw/Describe] tool for fast co-design with product experts from Brico Center.

PROGRAMME THEME	1 Sustainable Product-Service System (S.PSS) of Plastic Recycling [Systems Probe]	2 Needs & Challenges of the Homeless Population [Systems Probe]	3 Product and Materials for Extreme Conditions* [Materials Probe]	4 Role of the Neighbourhood [Systems Probe]
PARTICIPANT CATEGORY	Experts (S.PSS)	Stakeholder: Homeless Shelter Volunteers	Experts (Products/ Materials)	Stakeholder: NoLo Residents
DURATION	1.5 – 2 Hours	1.5 – 2 Hours	15-20 Minutes	5-10 Minutes
UNDERLYING QUESTIONS	Who are/can be involved in the plastic recycling and how?	What are the needs/ challenges of the homeless? How can they be met?	How design/use products/ materials to survive extreme conditions?	How and to what extent can NoLo residents play a part in the process?
BOUNDARY OBJECTS	Slow Co-Design: Product Life Cycle + Stakeholders [Diagram] Solution Cards Recycled Plastic Artifacts	Slow Co-Design: Product Life Cycle + Stakeholders [Diagram] Solution Cards Recycled Plastic Artifacts	Fast Co-Design: Materials [Draw/Describe] Recycled Plastic Artifacts	Fast Co-Design: Locals [Attitudes Map]

FRIDAY 11/11/22	MONDAY 14/11/22	MONDAY 14/11/22	WEDNESDAY 16/11/22	THURSDAY 17/11/22
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\*This session was conducted in 2 parts: 3a. & 3b, chronologically before and after session 2 respectively

Figure 13. Programs Schedule/Outline

### 7.3 Outcomes of co-design

Program 01	
Systems Probe: Sustainable Product -Service System (S.PSS) of Plastic Recycling	
SUBJECT OF EXPLORATION	What must we consider when designing a system which is sensitive and inclusive of both recycling best practices and the social issues of homeless people?
SESSION'S STEPS	<ul style="list-style-type: none"> <li>1 Introductions</li> <li>2 Explain the Tool</li> <li>3 Explain the Context/Brief</li> <li>4 Invite Participation</li> <li>5 Assist in Documentation (on-going)</li> <li>6 Introduce Recycled Materials Part-Way-Through</li> <li>7 Show Solution Cards &amp; Invite Reaction</li> <li>8 Collect Consent Forms and End the Session</li> </ul>
LOCATION	<p><b>SESSION 01</b> Politecnico Candiadi Campus mood: energetic</p> <p><b>SESSION 02</b> Mudec Cultural Museum Cafe / Bar mood: business casual</p>
PARTICIPANTS	<p><b>DONGFANG YANG</b> (S.PSS) Expert, LENs Lab, Polimi</p> <p><b>SAUMYADEEP BERA</b> Management Engineering, Polimi</p> <p><b>VERONICA DELBONO</b> Volunteer, Milano In Action (MIA)</p> <p><b>MICHELE LA ROSA</b> Communication Design, Polimi</p>
ROLES WITHIN COSEF TEAM	<p><b>END</b></p> <p><b>ELIA CRIPPA</b> Assistant Practitioner</p> <p><b>MORGAN RICARD</b> Documentation</p> <p><b>ROHIT MONDAL</b> Lead Practitioner</p> <p><b>ITA</b></p> <p><b>ELIA CRIPPA</b> Practitioner</p> <p><b>MORGAN RICARD</b> Documentation</p> <p><b>ROHIT MONDAL</b> Documentation</p>

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#### Stakeholder Character Cards

\*ALL materials exist in Italian and in English



Homeless People	Neighbourhood Inhabitants
Homeless People	Neighbourhood Inhabitants

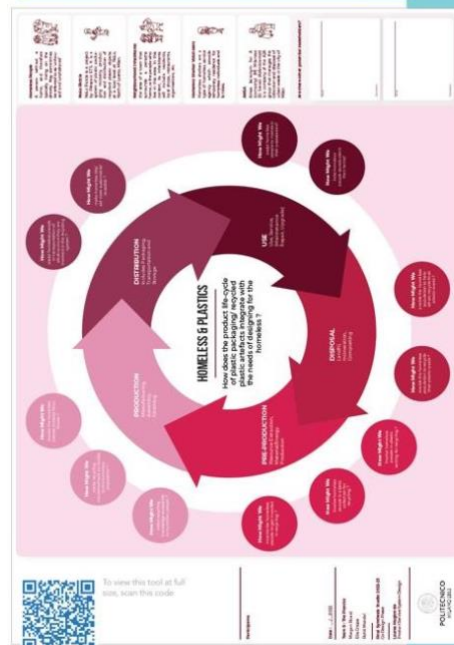
33

Figure 14. Program 01 details and materials (a)

AMSA	EPIDE BIKIN
AMSA	NoLo Ricicla
Homeless Shelter Volunteer	[blank]
Homeless Shelter Volunteer	[blank]

34

#### Product Life Cycle + Stakeholders [Diagram]



35

Figure 15. Program 01 Details and Materials (B)



36

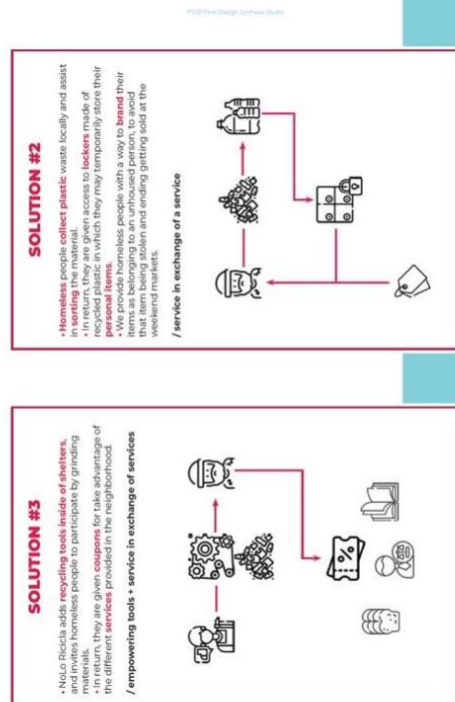


37

Figure 16 program 01 details and materials (c)



38



39

Figure 17. Program 01 details and materials (d)



### Evaluate the Sessions

#### Session 01

Did the session achieve its main aim?

yes  seems  no

Did participants interact enough?

yes  seems  no

Were the boundary objects/tools effective?

yes  seems  no

"What if" you can re-do the session?

*When given the opportunity to redo the session, we chose to eliminate post-it notes to encourage participants to draw directly on the board, and to instead glue character cards in place instead of having movable character cards.*

#### Reflections

11/11/22 – 14/11/22

The tools designed for the systems probes were revealed to be very effective. They didn't go through an important transformation from the first session to the second one; the only thing that changed was how we decided to present the stakeholders: from 3-D cardboard figures with a blank side where to write ideas (not very comfortably), that showed to be invasive and were concealing the questions written on the boards, with the necessity to move them away and so to take away from the board interesting ideas, to 2-D figurines thought to be glued on the board itself, to position actors in an easy way and with the advantage of directly writing insights around them, making also easier to connect ideas and generate new solutions.

For what concerns the board itself, it was perceived by the co-designers as a very clear tool; the questions written in the dots were very effective in inspiring ideas and making conversation start: users were constantly pointing to them, writing around them, or referring to them. What could have been seen, at the very beginning, as a visually overwhelming element, was revealed to be suited for guiding people among the complexities of the project.

Asking people to write was a double-edged sword: the co-designers from the first session enjoyed it, but it seemed also an action that was slowing the idea generation process. During the second session, we were writing instead of the users (that have been encouraged twice to do so but preferred to speak, constantly providing us with ideas and information. Experts expressing precisely in their own words is better but

### Session 02

Did the session achieve its main aim?

yes  seems  no

Did participants interact enough?

yes  seems  no

Were the boundary objects/tools effective?

yes  seems  no

"What if" you can re-do the session?

*We were very satisfied with the outcomes of the second session.*

slower; the important thing is to read the atmosphere and act as a consequence, depending on the willingness of the co-designers to "play" with the tools or not (we didn't force anybody to follow our initial ideas).

Furthermore, we noticed that during both the co-design sessions NoLo Ricicla's material samples were extremely effective in inspiring ideas and encouraging conversation: they were colorful, textured, with different weights and shapes; users simply loved them and they were perfect to raise attention or creativity again after the main brainstorming seemed to have reached its end. Showing beautiful and interesting boundary objects has been fundamental during both the sessions.

Participant Consent Forms




Figure 18 Program 01 Evaluations / Reflections

## Program 02


### Materials Probe: Needs & Challenges of the Homeless Population

SUBJECT OF EXPLORATION	When using recycled plastics to create products for comfortably surviving outdoor conditions, how can the material be best used?	
SESSION STEPS	<ol style="list-style-type: none"> <li>1 Introductions</li> <li>2 Explain the Tool</li> <li>3 Explain the Materials (only during session 01)</li> <li>4 Support Participant as They Draw and Describe Their Thought Process</li> <li>5 Document Process (only during session 01)</li> <li>6 Collect Consent Forms and End the Session</li> </ol>	
LOCATION	<p>SESSION 01</p> <p>Decathlon Portello</p> <p>mood: sporty &amp; busy</p>	<p>SESSION 02</p> <p>Decathlon Busnago</p> <p>mood: sporty &amp; calm</p>
PARTICIPANTS	<p>ANONYMOUS X 3</p> <p>Decathlon Sales Employee X 3</p>	<p>ANONYMOUS</p> <p>Decathlon Sales Employee</p>
ROLES WITHIN OUR TEAM	<p>ITA</p> <p>ELIA CRIPPA Assistant Practitioner</p> <p>MORGAN RICARD Documentation</p>	<p>ITA</p> <p>ELIA CRIPPA Practitioner</p> <p><i>*we were unable to record photograph this session</i></p>

### Draw / Describe Sheet

\*ALL materials exist in Italian and in English

MATERIAL SYMBOLS




DRAW HERE AND DESCRIBE YOUR IDEAS

**IDEAL PORTABLE OUTDOOR SURVIVAL PRODUCTS**

(If you were in charge of designing the IDEAL PORTABLE OUTDOOR SURVIVAL PRODUCTS out of these materials, what would you make it very?)

Draw Product in the Space Above



Product Name \_\_\_\_\_

Tags \_\_\_\_\_

Figure 19. Program 02 Details and Materials (A)



Figure 20 Program 02 Details and Materials (B)

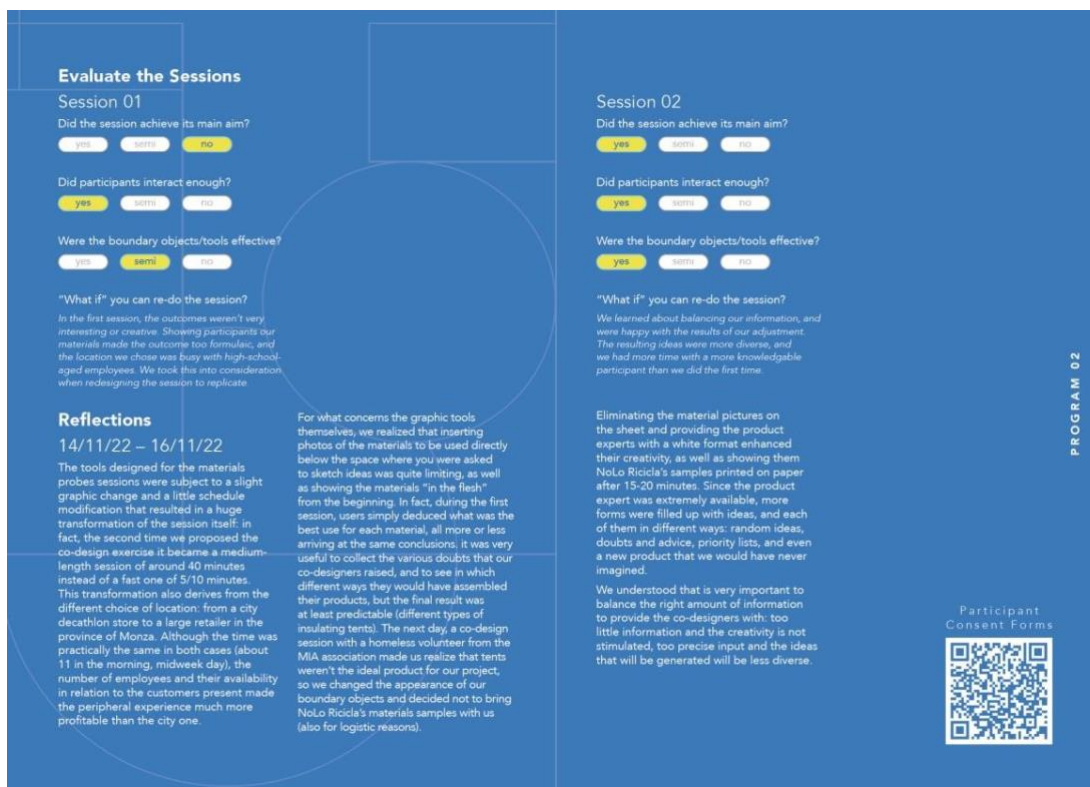


Figure 21. Program 02 Evaluations / Reflections

## Program 03

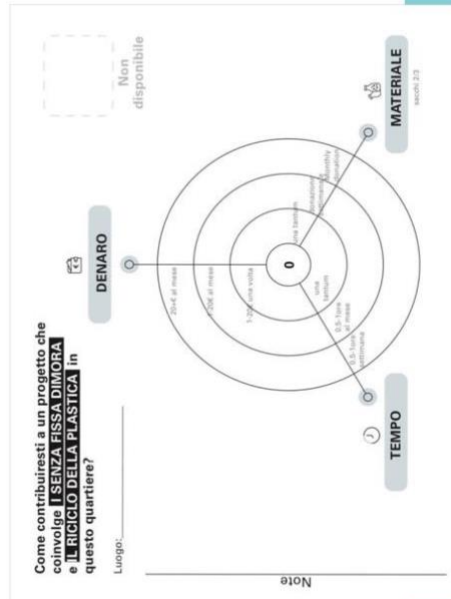
### Systems Probe: Role of the Neighbourhood

USER REPC. OR EXPLANATION	NoLo's community exists in two forms: pre- and post-gentrification. But as a whole, how willing are inhabitants to get involved with our project?
SESSION STEPS	<ol style="list-style-type: none"> <li>1. Introductions</li> <li>2. Explain the Tool &amp; Context</li> <li>3. Fill Out the Tool</li> <li>4. Thank Participant</li> </ol>
LOCATION	Piazza Arcobalena   Route between Piazza and Market   Mercato Comunale Monza <i>mixed: public &amp; brief</i>
PARTICIPANTS	ANONYMOUS X 9 NoLo Inhabitants
ROLES WITHIN OUR TEAM	ITA ELIA CRIPPA Assistant Practitioner MORGAN RICARD Documentation

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## Attitudes Map

\*ALL materials exist in Italian and in English



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Figure 22. Program 03 Details and Materials

### Evaluate the Sessions

#### Session 01

Did the session achieve its main aim?

YES  **SOMI**  NO

Did participants interact enough?

**YES**  SOMI  NO

Were the boundary objects/tools effective?

YES  **SOMI**  NO

"What if" you can re-do the session?

*We intend to continue this tool further along the design process, possibly with adjustments to fit future needs. We would like to find a more indirect way to address money as a dimension.*

### Reflections

17/11/22

The main aim of the co-design session with the locals was to understand the role they would be willing to play inside a product-service system that connects NoLo Ricida with the needs of the homeless in Milan, with particular attention to the area of NoLo and Stazione Centrale. When designing probes, this is referred to as simulating roles, to generally explore their possible level of participation.

The time for designing the tool for this fast co-design session was extremely limited (around two hours). We decided to assess NoLo inhabitants' willingness to contribute to our project through three dimensions: time, money, and material (plastic waste). Taking inspiration from the Sustainable Business Model Pattern taxonomy by Ludeke-Freund, F., Carroux,

S., Joyce, A., Massa, L., & Breuer, H. (2018) (though somewhat deviating from the visual structure in the end) we draw a scheme in which each of these dimensions was divided into three different ranges of availability, from the lowest to the highest: by marking with a dot each individual's availability for the three dimensions, we obtained several graphics that, once overlaid, revealed the overall availability of the population sample taken into consideration. We left some white space around the graphic for taking notes and decided to carry out the investigations with an iPad to make it easier the collection and confrontation of data.

This is the only tool that we didn't have the chance to apply a second time, but it is still possible to make some consideration of its effectiveness. First of all, the question we introduced the topic with was too general, especially when we were asking people how much

money they would have been willing to spend. It was necessary to include some of our ideas, such as the ideation of a little shop run by homeless people in the market, for helping people imagine the context. Time and Waste were way easier to assess, since not directly correlated to the attractiveness of a product/service. Personally, as the conductor of the sessions, [Elia] felt slightly uncomfortable asking people how much money they would have invested in the project - it is definitely a dimension I would investigate in a more indirect way. The idea of layering graphics instead was very effective and gave us in a quick and precise way an idea of the overall availability of the residents, highlighting a few interesting trends (such as the complete availability of donating material).

Participant Consent Forms

Figure 23. Program 03 Evaluations / Reflections

## Pre VS Post Co-Design

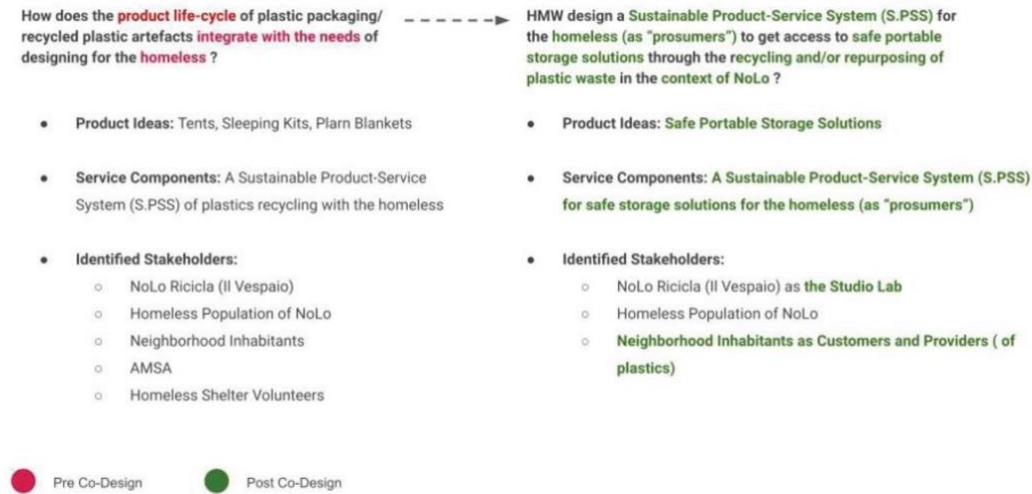


Figure 24. Pre VS Post Co-Design Comparison

Our team exited the co-design phase of the course with the following conclusions:



Figure 25. Co-Design Conclusions

## 8 Method 05: outputs

### 8.1 Project overview

Our final S.PSS is called Via RinNolo. Via RinNolo addresses the environmental issue of plastic pollution, and the social issue of homelessness, on a neighbourhood scale (beginning in Nolo, Milano). By creating training and employment opportunities for local homeless populations, Via RinNolo collects, sorts, redistributes, and transforms plastics into portable storage products for retail and access for prosumers. Via RinNolo products are designed to be modular, permitting a lifetime repair guarantee, keeping plastic waste from re-entering the environment. The system facilitates the use of single use plastics as a raw material for the creation of modular storage products by involving the homeless population of the neighbourhood in all phases of the plastic life cycle including preproduction, production, distribution, use and disposal. The system's primary objectives are as follows:



Figure 26. ViaRinNolo Primary Objectives

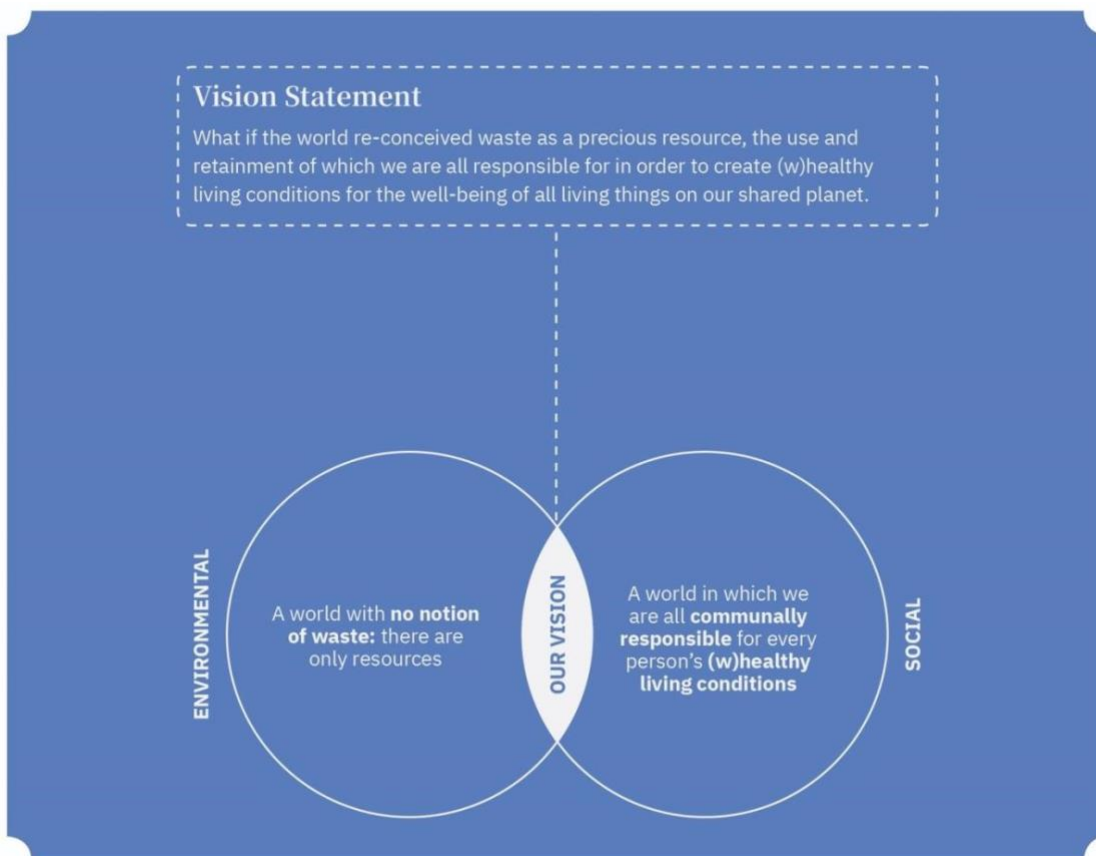
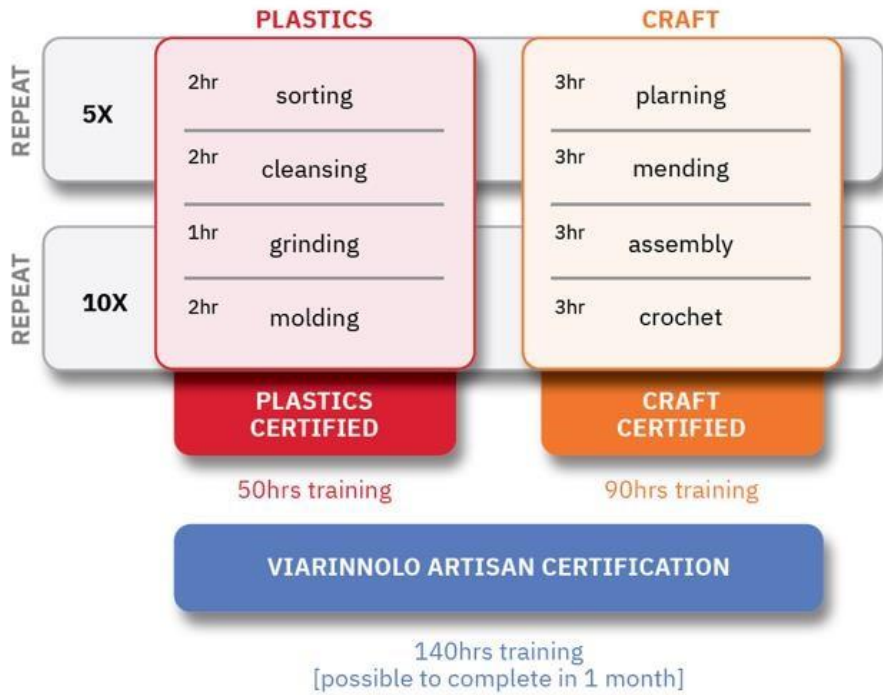


Figure 27. ViaRinNolo Vision Statement

We partner with homeless volunteers to collect used plastics to sort and transform the raw material into portable storage products for their personal use and for retail products which keep the system going. A main facet of our service system is the skills certification, which verifies a volunteer’s abilities and allows us to make a scalable compensation structure. These compensation prospects are designed to complement pre-existing housing solutions in Milan/Lombardi.



- sorting:** sorting types of plastic
- cleansing:** cleaning and disinfecting materials
- grinding:** breaking down hard plastics
- molding:** melting shredded hard plastics
- plarning:** making soft plastic into a yarn-like material
- crochet:** process of making textiles
- assembly:** turning modules into complete projects
- mending:** servicing broken products

Figure 28. ViaRinNolo Course/Certification Structure

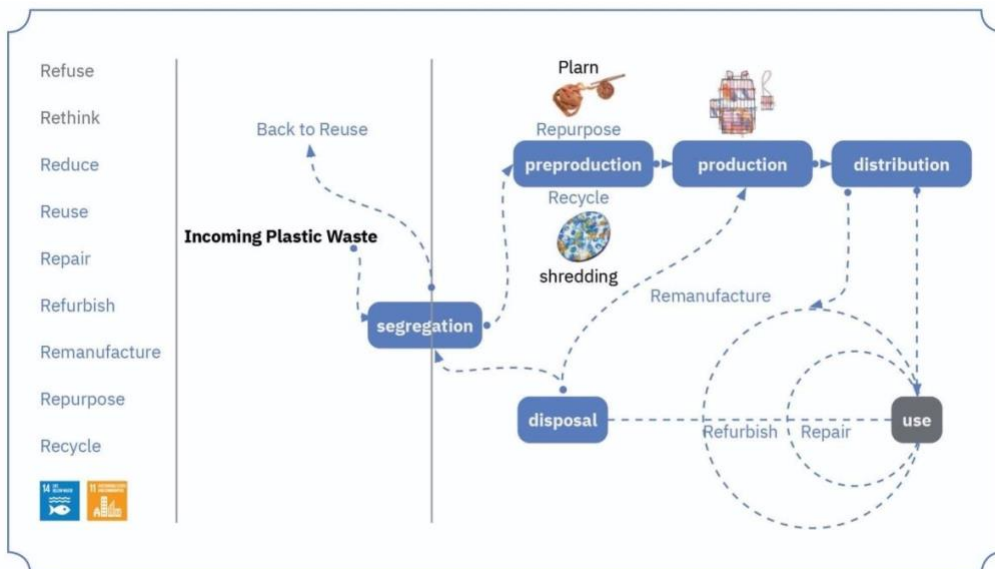


Figure 29. 9R's Map



Figure 30. Product Prototype



Figure 31. ViaRinNolo Facility Render, VR Headset Compatible (A)



Figure 32. ViaRinNolo Facility Render, VR Headset Compatible (B)



Figure 33. ViaRinNolo Facility Render, VR Headset Compatible (C)





Figure 34. ViaRinNolo Facility Render, VR Headset Compatible (D)



Figure 35. Comprehensive Project Outline | Developed for RO Plastic Prize

## 9 Method 06: public event

### 9.1 Polimi course exhibition

The course exhibition was held in Porta Moneta in January 2023. Students shared their work to an audience of their peers, the Polimi community, representatives from the Milano Municipality, Scuola di Quartieri partners, and the general public. Networking occurred among students and audience members alike during the following social hour, which may lead to new and inspiring projects in the future.



Figure 36. Final Synthesis Design Studio (M.Sc Polimi) Course Exhibition 2023



Figure 37. Final Synthesis Design Studio (M.Sc Polimi) Course Exhibition 2023

## 9.2 Milan Design Week 2023

After completing the course, our team went on to be accepted as finalists for the RO Plastic Prize, invited to participate in the Guiltless Plastic Exhibition during Salone di Mobile, and asked to participate in DesignXDesigners (Polimi's Design Week exhibition) in Bovisa.



Figure 38. Guiltless Plastic Exhibition, Brera Milano, Milan Design Week 2023



Figure 39. DesignXDesigners Polimi Exhibition, Bovisa Campus, Milan Design Week 2023



Figure 40. RO Plastic Prize Awards Ceremony, Triennale Milano, Milan Design Week 2023

## 10 Conclusions

Through developing Via RinNolo, our team engaged with all expected learning outcomes. Working with ilVespaio was an auspicious experience: though interaction decreased over the duration of the project, visiting their studio and speaking with designers who formerly attended our same university contextualized the work we were doing during our student careers. From a student perspective, this course was demanding and the complex evaluation criteria (to be useful to the our partners, to include social and environmental components, to be radical, to successfully use new tools, and to build a solution we believed in) created significant stress; but for my experience, this was a constructive stress which lead to additional success outside of the academic setting when applying for competitions and exhibitions. I was further inspired during the studio exhibition social hour when I met graduates from our same program who currently run a start-up which began in this course years prior; and was similarly inspire by meeting other finalists in the Ro Plastic Prize competition. Student-A and Student-C are now considering pursuing PhDs to continue working on co-design research, and all three students have expressed interest in future entrepreneurship.

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