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The neighbourhood home: An environments system from sharing to caring

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Abstract

Cities are changing. Wars, climate change and idealised better life opportunities open the doors for massive migration. Unfortunately, however, the new arrivals with their different backgrounds and lifestyles are often perceived as a threat to pre-existing culture and home. But what is 'home'? From the results of ethnographic research and an online open survey conducted for a master's degree final thesis in systemic design, 'home' is the neighbourhood that involves all the values and behaviours that everyone needs in their everyday life. This research led to the academic concept of the 'neighbourhood home', a system of new environments for future inclusive cities that aims to make all the inhabitants 'feel at home'. This notion is based on the idea that inclusion is developed through empathy, creativity and know-how, discovering the cultural rituals and myths of different peoples. In every structure (like Homes of Music, Language, Clothing, etc.), new and old citizens can rediscover their common roots, which have always been, today as yesterday, interconnected through a multiplicity of cultural handicraft expressions. The pilot project designed is 'MeetEat', a home that promotes informal cooking classes and social eating and is ingredient-driven (chosen on a seasonal basis) and organised by volunteer citizens in the neighbourhood. With the neighbourhood home' thesis, we aim to propose a system that can turn diffidence into curiosity, conflicts into sharing and exclusion into caring.

Keywords: City, Migration, Roots, Inclusion, Sharing

Introduction: Big cities and migrations

The world is constantly changing, and so are cities. They grow, their boundaries fade, and they change as fast as the new economic, commercial, social and political dynamics. According to the World Urbanization Prospect 2018, globally, most people live today in urban areas. Figures have radically changed from 751 million city residents in 1950 to 4.2 billion in 2018, and this is expected to increase to 8.6 billion in 2030 and 9.8 billion in 2050, more than double compared to today (UN Department of Public Information, 2018).

> *"Cities have been sites of incessant and most rapid change throughout their history ... The change is so profound and the pace of change so mind-bogglingly quick that we can hardly believe our eyes and find our way amidst once familiar places".* (Bauman, 2018)

While in some developing countries high walls separate the rich from the slums, generating an immovable division that does not allow for social mixing, big cities of Europe and North America see their borders widen, making space in the suburbs for new inhabitants. Cities become worlds that mirror the incessant mobility of our age, with the respective fears and anxiety. New and old inhabitants walk through their streets, with their dreams, problems, needs and different backgrounds.

> *"On the one hand, the world becomes a city, an immense city where the same large companies, the same products are found everywhere. On the other hand, the city, the big city, represents a world. The diversity of the Earth, the diversity between rich and poor, ethnic, cultural, origin and condition diversity: in the big city everything mixes. In it, we collide with the diversity inherent in the world".* (Augé, 2017)

Big cities of developing countries are theatres of incessant movements: today's citizens have frenetic lives, and frenetic work and sometimes forget natural human rhythms and sociality. However, the entire world also sees every day continuous migratory movements of different people who must leave their country, and their homes and feel the loss of their roots.

> *"Nomads traditionally studied by ethnologists have a sense of place and territory, a sense of time and return. This nomadism is, therefore, different from what is metaphorically called as such when speaking of current mobility. … It corresponds to the paradox of a world in which theoretically anything can be done without moving and in which nevertheless one move".* (Augé, 2010)

Literature review: Issues and opportunities for social inclusion

When we talk about 'cities', we are not only thinking of buildings, streets and shops but, above all, we are thinking of their inhabitants, who have to live together side by side. Migratory phenomena that have intensified in recent times (although always present in the history of humankind) have brought many new inhabitants into the world's most flourishing cities. The Caritas XXVII Immigration Report shows that in 2017, Italy hosted 5,144,440 immigrants—speaking only of the regularly resident—or 8.5% of the total resident population and is ranked fifth in Europe and eleventh worldwide in the list of countries that hosted the largest number of international migrants. Most live in major urban centres (Caritas and Fondazione Migrantes, 2018).

A huge number of people, today and in the last decades, left their home, their motherland and their familiar places because of war (68.5 million between 2007 and 2017; UNCHR, 2018), famines, desertification and climate change. Immigration and the consequent social tensions have undoubtedly become one of the most important and urgent issues of our time. Foreigners are often perceived by citizens as 'strangers' or even 'enemies' who raise suspicion because of a poor or inexact knowledge of their culture and customs.

> *"Strangers tend to give anxiety precisely because they are 'strange' and therefore frightening in their unpredictability. … We know too little about foreigners to be able to interpret gestures and decide on appropriate answers, understand their intentions, and guess their next move. And not knowing how to proceed, how to behave in a situation that we did not create or control, is one of the main causes of anxiety and fear".* (Bauman & Cupellaro, 2016)

The 2018 European Commission report shows that half of Europeans (46%) are 'not very well informed' about immigration and integration, in general, and tend to overestimate the number of immigrants in their country. Four out of ten Europeans believe that immigration is more of a problem than an opportunity for their nation, and this opinion is even more negative in Italy, the base country of this study, which is one of the countries that demonstrates major hostility towards immigrants. Most Italians do not believe that integration is taking place successfully (European Commission, 2018).

Another report, ‘A fragmented Italy’, demonstrates that there is a general feeling of self-loss among the citizens because of these social changes, to the degree that “half of the population reports that they have sometimes felt foreigners in their own country” and the majority fear that the national, traditional cultural identity is disappearing (More in Common & The Social Change Initiative, 2018).

Conversely, this sense of loss and these fears are perceived more by foreigners who have consciously left their territory, culture, connections and memories. The new places are foreign to them, and their condition is often of loneliness. The ‘integration’ we often hear about does not mean exchange, cooperation, mutual integration and organisation, but a pact of tolerance. Foreigners are asked to set aside their roots, uniqueness, traditions and knowledge to embrace those of the new country. Only by denying what makes them ‘different’ from us opens up the possibility of dialogue. However, dialogue is not only possible by denying the differences between peoples, but rather looking curiously at the roots we have in common because “the history of humanity is dotted with mergers of different groups ... it is a story of languages, religions, knowledge that have met and continue to meet, merging”. (Giusti, 2007).

These previous themes engaged us in reflection. How can foreigners be part of a community and be viewed as an opportunity for something better? This study, a master's degree’s final project that was designed from November 2018 to July 2019, addresses whether an integrated approach could be possible, considering migrants as persons with unique knowledge and wisdom. Working in cooperation with some reception centres and communities in Rome, through focus groups, co-planning activities and specific meetings that involved migrants, some concepts have been defined to mediate between the local and the migrant culture.

Methodology and research

To understand both locals’ and migrants’ real feelings and desires, the study started with ethnographic research through direct contact and online to collect as many insights as possible to develop a human-centred proposal. Two places in the city of Rome, rich in diversity and multiculturalism, were chosen for interviews and meetings: the Esquiline Market in Vittorio Emanuele and the peripheral district of Centocelle. These well-known landmarks for peaceful coexistence between citizens and foreigners were chosen to allow easier conversations and exchanges.

The first is a famous social gathering place, in which culinary ingredients from all over the world can be found, brought by migrants who, with their commercial activity, supply their communities. Here foreigners can find everything they need to prepare the typical dishes of their cultures and restore the sense of roots and traditions. “I miss my mother, my family, my sister. But we keep in touch, I see them online, and slowly I don't miss anything here in Italy”, an Asian boy said in front of the fish counter. He said that he also slowly appreciated Italian cuisine: “I really love pasta; it is so versatile. In the early days I ate only recipes from my culture, but over time I also enjoyed the meat and fish dishes of yours”. An elderly Arab man also stated:

> *“At the inauguration of this market, we had a great party. It was called 'Taste the world'. Everyone brought something [a dish], and every day there was a different cuisine, together with dancing, music, etc. It was the union of the world at the table, a union that brings happiness, love and peace”.*

Second, in the Centocelle district, small groups of Arab and Indian women stroll with their children, dressed in their traditional clothes and conversing in their languages.

"What do you miss most of your land?"

"The taste of the fruit and vegetables of our typical agriculture and the dishes that my mother cooked in my family".

"Tell me about a good time you had in this city".

"It was in a small market: I was telling how meat is cooked in my culture, and a person looked at me in amazement. He was a Jewish man, and he said that his family also cooks meat in a similar way. We laughed … it was beautiful. It made me think that the world is small".

To extend the range of interviews, an online survey was launched on social networks, which allowed people to speak more freely and anonymously. A platform like Facebook is used by both Italians and foreigners because the Internet enables them to keep in touch with their friends and family in their country. Eighty persons answered the question "What is 'home' to you?" and the results were collected, analysed and clustered in a Word Cloud map to trace the most frequent feelings, grouped with different colours, and the most frequent word pronounced, excelled with a higher dimension.

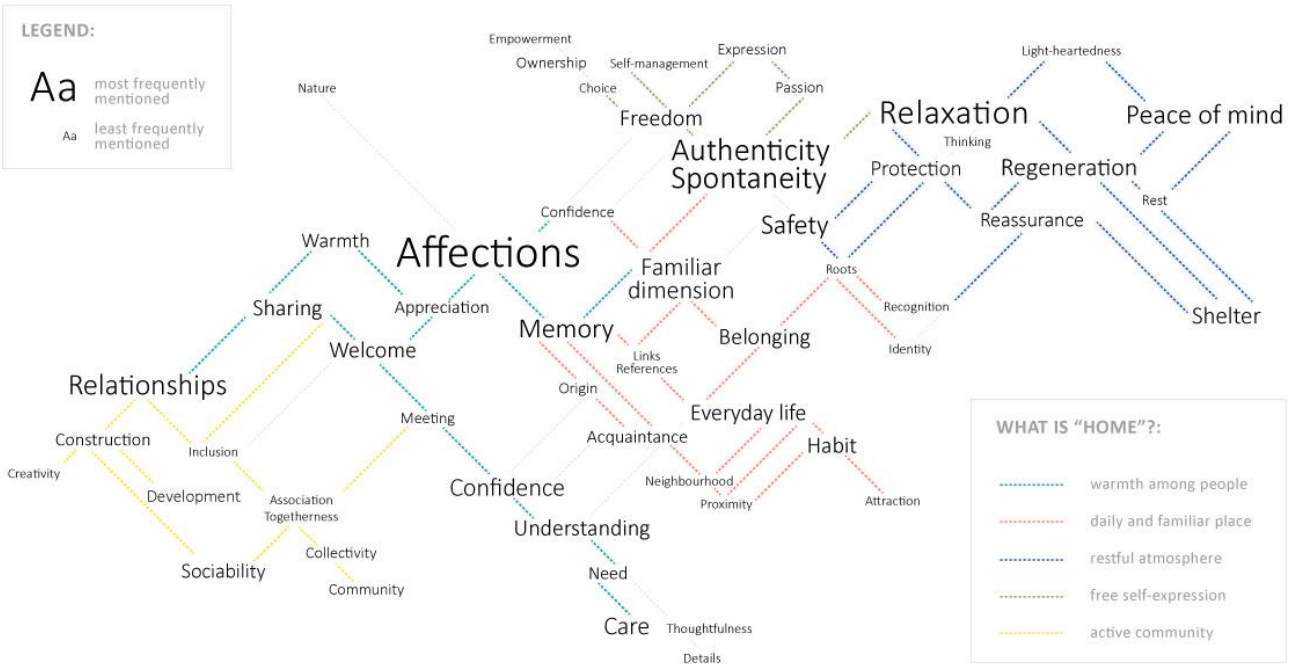

Image 1: Word cloud map of the clustered answers to the survey "What is 'home' to you?".

The majority perceived 'home' as the place where affection and warmth can be found, where there are feelings of welcoming, appreciations and so many memories. 'Feeling at home' is about a sense of 'family' and 'belonging' in everyday life, a place that is familiar and well-known. At home, people can relax and be authentic and spontaneous because they feel protected like in a reassuring refuge and can express themselves. There are relationships and sociability, that sense of 'being together', which forms a solid community.

However, the most interesting aspect that emerged from the survey was the role of the neighbourhood, which is a perfect intersection between the overall city and the welcoming atmosphere of our own home. The neighbourhood represents an important part of daily life: in these places, everyday memories are built

and insecurity can be illuminated by progressive familiarity with its streets and shops and with the people who daily navigate them.

System concept: The 'neighbourhood home'

Setting the neighbourhood as the ground of the concept, we defined the design scope as 'inclusion', not of foreigners in a different land, but rather of all citizens, old and new, in the fabric of a city that is constantly changing all over the world. The project aims to promote the transmission of different cultural knowledge and then co-creation behaviours within the community of the neighbourhood, to build a new, unique and collective cultural heritage that is flexible and resilient and can be perceived by every inhabitant as their own. The neighbourhood home project was born: a space for socialisation, receptive to inhabitants' needs and open to neighbourhood improvement proposals.

The goal is to improve people's inclusion in the small context of the neighbourhood, encouraging people to share their roots' culture and knowledge. By understanding each other's different cultures and traditions, a sense of belonging can be created, and new values and behaviours can be built. This goal can be achieved through a common mediator of all humankind: culture. Promoting cultural activities in the neighbourhood home, citizens will be able to network, know each other, co-create and share local initiatives. Each different culture produces, today as yesterday, specific traditions, rituals and myths that are grounded as cultural roots. As anthropology and sociology teach, only by understanding cultural practices do we understand the people who are part of it.

Moreover, with a neighbourhood home in each district, an entire system of welcome, culture and creativity can be created. Each home can have a specific cultural focus: there will be a Home of Music, a Home of Costumes, a Home of Language and many others. In all its forms, from culinary to literary, artisan, musical, and so on, culture can be a link between people throughout the world.

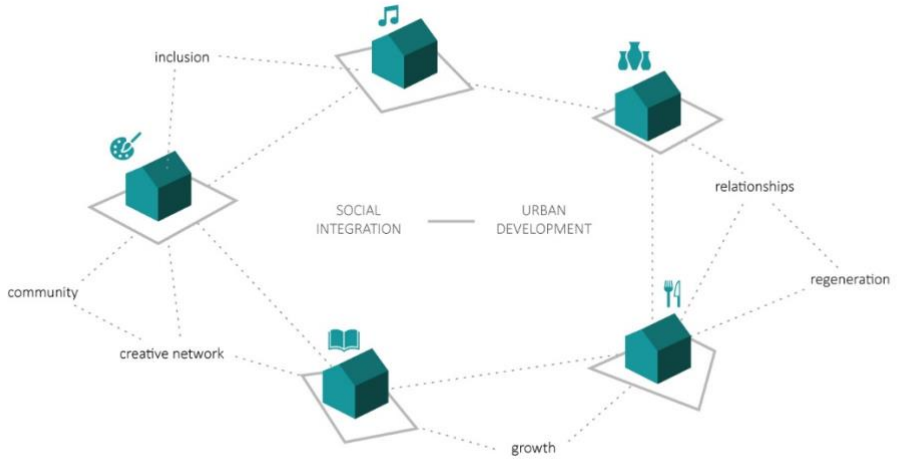

Image 2: The neighbourhood home system concept.

Each structure is imagined as a newly built pavilion with a specific shape and provides specific tools based on the cultural focus. The home buildings can be on land that needs redevelopment within the urban structure and is itself the first improvement to the district. The contents of the activities in each neighbourhood home will not be fixed but variable, as they will be spontaneously proposed and self-

managed by the neighbourhood's inhabitants, which is a flexible way to allow everyone's creativity to emerge and shine.

By creating a net of inclusion among the inhabitants, the second goal of the neighbourhood home system is to enhance and develop the neighbourhood itself and the city and to bring the restored empathy (Massari, 2020) from people to the territory in which they live. In the space perceived as their own home, inhabitants are enabled to discuss neighbourhood issues and identify solutions together, for example, to organise a petition and volunteer events for their community.

The project may interest both private and public institutions, such as municipalities, regional authorities or large companies providing goods and services that are sensitive to social issues. This system could also become supportive of municipal policies and help to manage the complexity of the problem in the neighbourhoods of Rome, as in other cities.

Case studies of neighbourhood communities

The concept of the neighbourhood home combines the scopes of citizens' inclusion with neighbourhoods' revaluation with a benefit especially for the peripheral districts who have seen their borders widen. But it is not the only initiative in the world that aims to improve neighbourhoods' conditions in a big city.

The 'School of Neighbourhoods' ('Scuola dei Quartieri', https://www.lascuoladeiquartieri.it/) is a project of the Municipality of Milan with two purposes: to create projects and services designed and implemented by citizens for improving the lives of neighbourhoods; and to transform the suburbs of the city, enhancing the energy, creativity and resourcefulness of their inhabitants. Through workshops, training courses, competition notices and public incentives, the school helps citizens to realise ideas and projects that are useful for the entire local community. The system includes a website and an app that present similar sections: #goodstory collects real stories of people who, through their dreams and activities, have created something good for their neighbourhood; and #goodidea tells the School about competition notices and shows the citizens projects that could win the opportunity to be realised. Moreover, by registering on the app, citizens can see the calendar of events and initiatives promoted by the school, which is a series of opportunities available to everyone to help regenerate the suburbs.

Across the ocean, in America, the artist and professor, Theaster Gates, has launched numerous projects for the redevelopment of the Greater Grand Crossing neighbourhood in the South Side of Chicago. That urban area was full of abandoned and decayed houses because of the failing housing market, buildings which people no longer knew what to do anything with. Working collectively with other artists, architects, activists, educators and entrepreneurs, Theaster started reshaping, as one of his pieces of art, how people imagined the South Side of the city. He founded the Rebuild Foundation (https://rebuild-foundation.org/), a non-profit organisation focused on culturally driven redevelopment in under-resourced communities. For their most celebrated work, the 'Dorchester Projects' on Dorchester Avenue, he bought two of those vacant buildings—now called the Archive House and the Listening House—and involved the local neighbourhood in the restoration. The Foundation turned the renewed buildings into cultural institutions to stage exhibitions, small dinners, lectures, book readings and workshops in the neighbourhood community. The Listening House gathers discarded books from collections and out-of-business bookstores. The Black Cinema House plays movies that are important and relevant to the black people of the neighbourhood. In the Arts Bank, there is a collection of memorabilia from people who live or have lived on the South Side, which reflect its identity and talk of its complexity.

What interested Theaster the most was not a single house or building, but rather the cooperation between that house and the local school, shops, markets, parks, etc.; connections through all these buildings can have a dialogue with each other. He was able to collect all the people passionate about their neighbourhoods and gather together the right professionals who could realise their dreams through his lens of culture and art. His purpose was to rekindle the interests of the inhabitants through culture to get them to reinvest in their place. His attention goes to the connections that can be created between one house and another and then between one neighbourhood and another.

Both these case studies demonstrate the existence of widespread social interest in the improvement of cities to adapt and react to global changes and guide new ones within their territory. The participation of citizens in the renovation of their neighbourhoods is not only possible but desirable. Only the inhabitants themselves can stand up and carry out initiatives to improve their living conditions. Bottom-up projects are possible and are already implemented in cities. What is needed is the development of a culture aimed at sustainability through workshops, training courses, social initiatives, awareness campaigns, etc., to stimulate the common desire for improvement and the will to do something about it.

These testimonials show that the objectives of renewal, dialogue and inclusion can be achieved by activating a network of interested people: first of all, citizens and municipalities, with the support of cultural institutions, investors, social change associations and also private companies and organisations. Moreover, migrants can be an active and positive (no longer negative and neglected) part of this change, allowing them to finally feel part of a place that appreciates them, listens to them and values their different knowledge and points of view.

Pilot project: The neighbourhood… food

As a pilot project for the neighbourhood home system, food culture was chosen as an intermediary for inclusion and socialisation, since food is one of the most immediate vehicles for sharing the rituals, knowledge, lifestyle and myths of different cultures. “Eating other people's food seems easier—even if only apparently—than decoding its language” (Montanari, 2011). Food has never been seen by human society as mere nourishment, but has always been enriched with other symbolic and relational meanings that go beyond its nutritional value. “Sharing the same food is at the origin of all rituals” (Barilla Center for Food and Nutrition Foundation, 2019). Sharing a meal represents an ancient and always effective bridge between cultures: diners will first notice the differences between their culinary cultures, but then, most importantly, the things in common. Foods, ingredients and recipes in history have always travelled across lands and continents following people (Bloch-Dano & Prencipe, 2017), which is why today’s typical ingredients of a culinary tradition often actually originate on the other side of the planet (the tomato, very dear to the Italian cuisine, for example, is originally from America).

For a neighbourhood home centred on food, two core activities have been imagined: cooking classes focused on an ingredient chosen by the home on a seasonal basis and social eating sessions, in which all the participants of the cooking class can share the meal. These activities will allow not only people to gain confidence in each other in a relaxed context but also to understand how the ingredients connect people around the world.

Every inhabitant of the neighbourhood can freely and spontaneously propose a cooking class in the home setting and can add the event in the community’s (online and offline) calendar. Through the classes, people can share stories of their culture, specific gestures and cooking rituals from their typical tradition, teaching

a recipe that fits the established seasonal ingredient. The social eating at the end of the lesson brings all participants to the same table and makes that social inclusion effective.

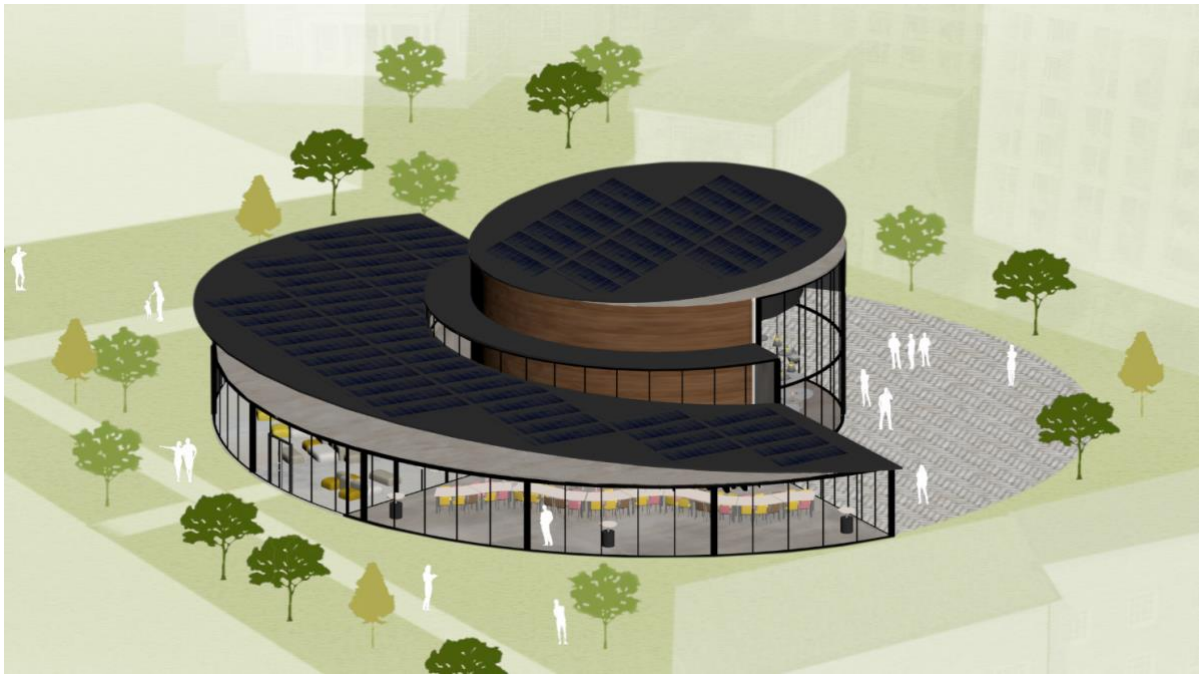

Image 3: 'MeetEat' pavilion from above.

Image 4: Architectural elevation, front (above) and rear (below).

The structure, called 'MeetEat', is imagined as a newly built pavilion entirely designed around the themes of integration, nourishment and sustainability. The journey starts at the entrance area, provided by

a reception for passers-by's curiosity and information, an entire wall of interactive digital frames showing past initiatives that have become shared neighbourhood memories and modular and freely aggregable seats for dialogue and waiting. Here citizens can also have information about the network and the activities of the other neighbourhood homes in the city. These are in constant communication with each other. Registration for the initiatives can take place on the online platform, on the interactive screens or at the desk set up for support.

Image 5: Entrance area with a reception desk and view of the dining hall.

Image 6: Entrance area, focusing on the seats and the digital frames.

Over the entrance, the journey continues in the kitchen area, the main feature of this home. Here, all those who want to participate and learn will be able to register for free, bring ingredients with them and use the spaces and tools provided by the structure. The kitchen has an innovative and 'neutral' interior design because the neighbourhood home needs to be flexible and abstract from any specific culinary cultures. This choice of neutrality aims to create new behaviours and values that favour community and participation rather than choosing a typical layout of one culture at the expense of others.

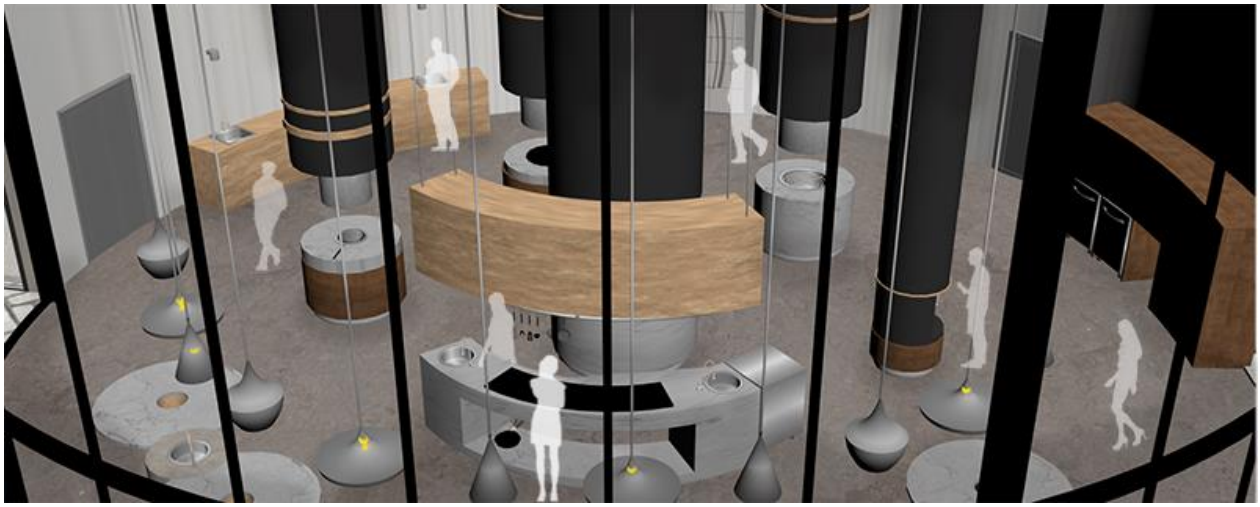

Image 7: Kitchen area from outside.

Image 8: Kitchen area, with a focus on the 'Earth' section during a cooking class.

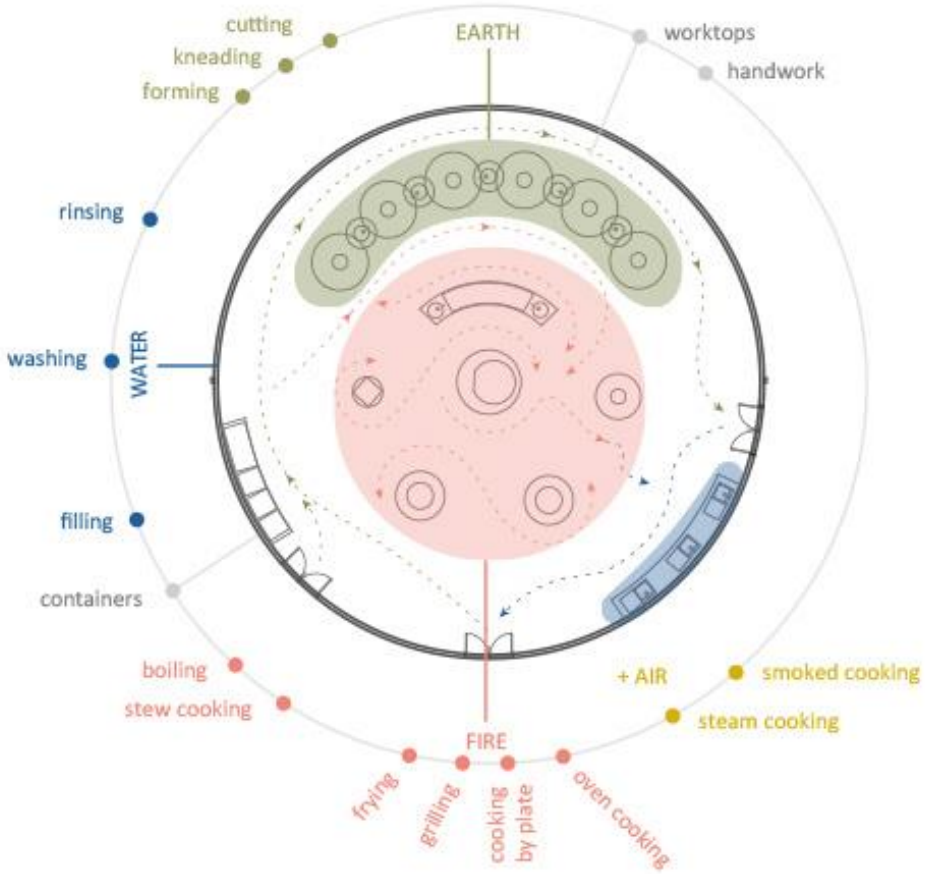

Image 9: Architectural plan of the kitchen with the semantic and functional organisation.

To identify a common core of all food preparation, every possible action of a general cooking process was analysed:

1) Storing the participants' ingredients: containing and refrigerating
2) Preparing the ingredients: cutting, cleaning, kneading, washing, etc.
3) Cooking (if needed): boiling, frying, smoking, grilling, steaming, baking, etc.
4) Dishing up
5) Washing

The clustering and arrangement of these activities and their corresponding furniture took inspiration from the Lévi-Strauss culinary triangle semantics. The metaphor of the four natural elements (water, earth, air and fire) was used because each one is essential in all culinary traditions and can evoke the imagination of the ancestral rites of all culinary spaces.

A) The 'Water' section collects all the 'filling' (as a cauldron) and washing activities: containers, pantries, shelves, refrigerators, sinks and dish drainers;
B) The 'Earth' section is dedicated to handwork such as 'kneading', 'cutting', 'forming', etc. and has a group of worktops equipped with sinks, drawers for instruments and waste bins;
C) The 'Fire' and the 'Air' sections are six functional blocks for fire-related activities, each provided with a different type of cooking: stove, oven, wood-burning oven, grill, plate and deep fryer. The 'Air' section corresponds to the ventilation hoods system on these fire blocks to guarantee vapour and smoke absorption. The six fire totems are the core of the entire MeetEat pavilion because they

represent—at a mythical level—the fireplace of the tribe, around which stories, culture, myths and rites are transmitted.

Image 10: Social eating in the dining hall (street view).

The journey in this home ends in the dining hall, where the experiences of inclusion, socialising and empathising are consolidated by sharing the meal altogether. This is a meeting space, too, a comfortable area that allows citizens to discuss neighbourhood problems, find some solutions and organise collective social events. To merge these two purposes (the social eating sessions and the citizens' meetings), a modular table has been designed that allows multiple combinations for space flexibility. In MeetEat, a community as a sustainable and inclusive network can be created, responsibility for neighbourhood wellness can be fostered and a renewed sense of belonging can be inspired.

> *"There is a growing need to find new ways to defeat food paradoxes (malnutrition, non-sustainable production systems and the battle against food waste, to name a few). In the past 15 years, the design method has been consolidating into this field of food. Participatory design and co-creation in food experience design became popular along with the discipline of food design and social design." (Massari, 2017)*

Conclusion

Around the world, many projects have been designed to increase inclusion and interaction with migrants and foreigners in response to global and urban changes. However, fewer projects have been designed for the inclusion of all citizens to stimulate a new sense of community belonging and a renewed civic responsibility.

The neighbourhood home project aims to highlight the common roots of all peoples in the world, who have always been interconnected by culture through migration and trade in history. Culture is the human dimension par excellence: in each territory, culture has been shaped in typical expressions, rituals and

myths that enclose people's real essence and values. It is necessary to understand these rituals to realise the underlying cultural values and traditions. Transmitting and sharing gestures of typical cultural activities from all over the world, the neighbourhood home system will help create inclusion with each other in the district (and the entire city) context.

This approach can generate not only a more inclusive society in each neighbourhood but also a possible common cultural heritage, composed of new shared values and behaviours and can become part of their daily lives. No longer "I" and "them" but an "us". Curiosity for diversity must be the social innovation engine, an opportunity for growth and wisdom that allows us to recognise and valorise, in the end, our common roots. More inclusive cities and nations should be the most desirable goal today, transforming conflicts and social exclusion into interconnections and sustainable communities.

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Far-sighted communities: Design meets future studies to boost visioning and participatory foresight

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Abstract
The increasing uncertainties of all contemporary communities require future literacy, and strengthening the participatory dimension of foresight practice is part of the solution. The "Montagna 4.0 FutureAlps'" project involved high school students, teachers, businesses and stakeholders of Valtellina, Northern Italy, in local laboratories of participatory foresight through a codesign approach. This article briefly reports the project framework and the visioning exercises undertaken to build meaningful images of the future (2040). Such images should be able to question and broaden the current development visions of the Alpine Valley and inspire a collective design of its development trajectories by raising the community's awareness of current and future changes. The activities took place over six workshops with three meetings each from September to December 2020, involving students ("@Scuola"), local stakeholders ("community lab") and the general public and experts ("Open talk"). Each workshop focused on a specific topic, such as the mountain of tomorrow, sustainable innovation, social innovation and sustainable communities, protection, production and promotion, sustainable mobility and events for Alpine tourism. The outputs consisted of uncertainty scenarios, postcards from different futures and indications to make development strategies future-proof, which are all elaborated on in this article.

Keywords: Codesign, Design Thinking, Foresight Scenarios, Future Literacy, Envisioning, Commons, Social Innovation, Local Development

Introduction
All our decisions are based on some images of the future, from daily individual choices to an ambitious personal career project and from a local administration's daily decisions to longer-term projects and programmes for the local area or the country. Design thinking naturally involves sharing images of an imagined future service or artefact to develop or materialise. When the object of visualisation and development is a larger system such as a territory or its subsystems, such as tourism, housing policies, mobility and accessibility, the level of complexity increases. Future studies' paradigms and tools can help to untangle this complexity and integrate the design process to be more explicitly future-oriented. Being future(s)-oriented means considering some critical questions for the design process, leading to future(s)-proof solutions. These questions concern the possible changes in the specific design context and the extent of the uncertainties that could make solutions effective today but non-functional in the future.

In this article, we elaborate on an experimental codesign project that involved an entire community and different social groups. We present the premises and the educational vision first, followed by the case study and the wider context of the experimentation. In addition, we describe the stages and the approaches, thus representing a potential toolkit for participatory foresight.

Premises: The indifferent citizen and the far-sighted citizen

The school's mission as a social institution is to educate proactive citizens, responsible for their choices and their community's qualities, providing tools and facilitating the learning of skills. The expected result of every effort and investment in this direction is to create open futures of personal and collective fulfilment with the ideal outcome of bridging personal futures, collective or even global futures (think about climate change as connected to choices of individuals and entire countries), overcoming the dichotomy between optimism and pessimism through a proactive attitude based on long-term views and critical thinking (Bodinet, 2016; Miller, 2015).

These goals are made more difficult in times of great uncertainty where society and individuals are tempted or invited to lock themselves into a "bubble of the present". Living in such a "bubble of the present" means being less and less related to the past and to the future, with increasing concern or even fear about an uncertain future and real or imagined risks, at the same time without meaningful references from the past. The condition of living in a "bubble of the present" could be associated with "short-termism"m an attitude in which individuals primarily prefer short-term values (Marginson and McAulay, 2008). It can also be related to an extreme philosophical interpretation called "presentism", according to which "only currently existing objects are real. Computers, but not dinosaurs or Mars outposts, exist" (Sider, 2001).

At the other extreme of living in a present bubble is "futures consciousness", which, according to the futurist Anita Rubin (2002, p. 906), is an "active and action-oriented perspective on the future, present and past and the relations between these. [It is] an internalised form of the development of thinking [and] a specific effort to form a conception about the meanings and consequences of issues and our daily actions". Rubin thus highlights the notions of agency, internalised future thinking and the links between the past, present and future.

Inspired by these ideas, we distinguished two opposite fictitious types of citizens: the "indifferent citizen" and the "far-sighted citizen". The first represents the citizen as a self-centred individual, essentially a consumer of services and products who is interested in satisfying their primary or induced needs soon, without a perspective from which to assess the consequences in the medium and long term. When not satisfied, their urgency easily creates frustration and apathy. In any case, the same limited horizon leads them to a reactive attitude towards events and in the face of undesirable changes ("surprises") to seek others' faults and responsibilities.

The "far-sighted citizen" is interested in their own history and the history of their community or of those who share their time. Their horizon of perception, observation and action is broad enough that it necessarily intersects and interacts with that of other citizens, so they easily see their fulfilment as connected to that of their own community. This attention trains them to better understand changes and distinguish between those that are uncontrollable and those that can be influenced by their own actions (compared to the former they prepare to adapt; compared to the latter they prepare strategies). Through all this, the far-sighted citizen somehow owns their time, recognising their responsibilities.

The "Montagna 4.0" project described below starts from these premises with the ambition not only to educate "far-sighted citizens" but also to facilitate "far-sighted communities". The design approach and the futures studies tools seem to ground effective synergies towards this objective. Nowadays, it is increasingly essential to think in a cohesive, community-based logic capable of reflecting on the changes underway as

well as co-constructing new opportunities. This also applies to mountain regions experiencing profound and increasingly rapid changes, impacting both the global and local levels.

Montagna 4.0 FutureAlps framework and background

(SEV) has operated since 1993 as a think tank to promote sustainable and quality-oriented local development in Valtellina, recovering fundamental values and pursuing strategic orientation for the future from a global perspective (Quadrio Curzio, 2008).

Since 2017, through its Scientific Committee, SEV has offered a series of workshops in Bormio to strengthen the local community through participation and co-responsibility. Investing in people with interactive workshops is deemed critical, as future choices are to be made as a community. "Montagna 4.0, building the future together", with ten meetings for each edition, has registered broad participation, open to the whole community, and with the integration of different skills. By calling it "Montagna (Mountain) 4.0, building the future together", a legitimate question that arises is "What about Mountain 1.0, 2.0 and 3.0"?

Montagna 1.0 may refer to the "subsistence" age. “2.0” concerns the Industrial Revolution’s effects, with the first industrial activities and factories. “3.0” relates to the intensive exploitation of natural resources and a strong relationship with the city. “Mountain 4.0” thus opens up new scenarios for the potential of the green economy, digitalisation and innovation that can unlock regions. It is a question of being aware of what effects change brings about and recalling the need for conscious and coherent policy choices at a community level. It represents a process of laying the foundations for a new awareness in the face of change, aiming to curb depopulation risks by showing opportunities for growth and sustainable development can be built together. Year after year, it has envisaged an open competition of ideas, since there are no top-down recipes but only bottom-up solutions. The second edition of the competition extended its focus to high school students so that they could explore the relationship between mountain identity and innovation. It was named "The mountain I would like" in a growing focus of young people to envision the(ir) future(s), as the future is to be seen as plural, given multiple possibilities for the futures to happen.

Building on "Montagna 4.0", "Montagna 4.0 FUTUReALPS" represents an example of how community self-training and participation methods can be experimented, beyond the mere consultative dimension. This leads to new dimensions of taking care of the community that grows itself through forms of awareness-raising in order to contribute and actively operate in the co-definition of their development scenarios. Therefore, the adopted approach from the start aimed to focus on the local identity’s fundamental values, a precious starting point to confront challenges and build opportunities, in order not to be overwhelmed by change.

"Montagna 4.0" involved university professors and representatives of the Alps as witnesses of specific practices on topical issues with a mix combining an academic-scientific approach with practical examples and ideas. The main topics discussed included circular economy and sustainability, business innovation, tourism models, destination management for the enhancement of local assets and effects on tourism, biodiversity and Alpine development, identity and values, social change and welfare, climate change, finance, resources, Alpine culture and communities and mobility. The workshops represented a valuable tool for community growth, highlighting that an innovation culture is critical for local development.
For this reason, proceeding with the experimentation has been fundamental by making “Montagna 4.0” – labelled FUTUReALPS—move around in the various Valtellina districts and through a network with other alpine areas.

The process was structured into six workshops taking place throughout the area, with mornings explicitly dedicated to schools, afternoons to community labs and evenings for the whole community with discussions aimed at enlarging the vision of the whole Alpine area. The keywords of FUTUReALPS have become community, innovation, territory, sustainability and tourism.

The opening in Bormio focused on the future of mountains, choices to be made and strategies, with particular attention to the future of tourism looking at the demand side. Subsequently, the focus shifted to companies and the area in which they are based, considering the potential of digitalisation, corporate responsibility and the creation of shared value. Furthermore, FUTUReALPS focused on what strengthens and disrupts communities and helps them be more aware of their resources.

Another central theme has been environmental protection, production and promotion and scenarios for the appropriate enhancement of tangible and intangible heritage. The following workshop focused on mobility and how critical it is to network today for tomorrow's mobility and the close relationship between mobility and tourism. Here, too, the operators confronted the students' visions of the theme of sustainable, shared and smart mobility. In the "Montagna 4.0 FUTUReALPS" final workshop, students and then stakeholders concentrated on the future perspectives of tourism and events in the Alps and how communities could be proactively involved. There was also reference to the Winter Olympics of 2026, a unique opportunity for the valley and an extraordinary tool within a longer-term (2040) plan.

"Montagna 4.0 FUTUReALPS" developed according to both a horizontal and a vertical dimension: horizontal as moving both in space throughout the territory and in time since looking at 2040, a journey often described as taking place through space and time. The vertical aspect entailed each day's structure with three consequential moments feeding one another, morning postcards from the future labs with students, intergenerational afternoon community labs and evening open talks looking at the Alpine dimension.

A design toolkit for participatory foresight

The FUTURe ALPS process embraces a codesign approach and tools to nurture participation and answer the specific need to include significant non-expert viewpoints, especially concerning the young generation. We can take the example of the most common and acknowledged design creative processes, the Double Diamond conceptualised by the Design Council (2014), arguing that all the steps of the divergent and convergent phases could be developed collaboratively. Considering this sequence of phases as a linear process, we can create a two-pole axis that summarises the subject matter behind the design. The topic-driven activities refer to the problem/situation that must be investigated (first diamond); the concept-driven activities refer to an orientation defined through the problem-solving brief (second diamond). The FUTUReALPS process mainly goes through the first topic-driven phase.

With its expertise in facilitating and activating communities, how could design support such participation in developing future imagined scenarios? In Massive Codesign, as Meroni et al. (2018) said, a crucial issue is how to conduct the practice of "joint inquiry and imagination" of codesign. It is described as a process «in which diverse people jointly explore and define a problem and collectively develop and evaluate solutions. It is a process in which participants can express and share their experiences, to discuss and negotiate their roles and interests, and to jointly bring about positive change» (Steen, 2013, pp. 27–28).

In each workshop, specific labs dedicated to students helped them think creatively about future scenarios by looking at the most uncertain factors and their impact. Each student (of about 150, from 6 schools) was

invited to make personal reflections, to discuss in small groups of peers from the same class and face to face, to interact with working groups from other schools (connected online) and finally to produce postcards from the future. Alongside this, the community labs triggered intergenerational dialogue between students and stakeholders through a backcasting approach, moving from possible futures twenty years from now to roadmaps to undertake today. Scientific studies and experiences from all over the Alps were presented in the evenings, with best practices shared.

This structure allowed us to foster participation and make co-creation accessible. There is not full consensus about the definitions and reciprocal boundaries of the terms *participation*, *collaboration*, *codesign*, *co-creation* and *co-production.* This is perhaps because some academics include "use" itself as one of the last phases of the design process, thus calling all the activities "co-design" (for example, pre-design, discover, design, make, distribute and use are the phases according to Sanders and Stappers, 2012). At the same time, other scholars distinguish design activities, which happen at project time, from consumption moments, which happen at use time (project/use time distinction can be found in Ehn, 2008). The term co-creation will be used as a hypernym of both codesign and co-production, as Freire and Sangiorgi (2010) do. What co-design does is simulate use before actual use happens by involving potential final users as sources of ideas and experiences.

Of course, during the FUTUReALPS format, we can just practise co-design, reflecting on co-production only thanks to other colleagues' examples (the contents evening talks). We could see how other Alpine communities look at their possible futures by adopting similar or different tools. Besides, the shared aim is to strengthen local communities to extend and consolidate their networks of relationships through a continuous learning process, thus reshaping futures in times of pandemics. Designers and tutors played the facilitators' role, encouraging interactions amongst participants and raising awareness of the process. They also facilitated participants' interaction, critical thinking, self-criticism and their capacity to think out of the box and beyond their own comfort zone.

Specifically, looking at the guidance approach, we can argue that it ranges between two positions, "active listening" (Sclavi, 2003) and thought-provoking, reflecting a difference in purpose and situation. A scenario workshop facilitator does not tell people what to do or think, nor do they forecast anything, but they "draw out (e-ducare) the concerns of others" through leading questions and exploring the uncertainties relevant for the strategic issue. The facilitator then needs to know quite a lot about the subject under discussion to ask those questions that lead in the most productive direction (Ogilvy, 2002).

A thought-provoking style, on the other hand, leads the participants' thoughts towards some critical aspects or opportunities of a given topic or concept. This guidance is likely to lead the participants on the thought process and speculative journeys aiming to generate reactions and, in general, responsiveness to a set of expected plausible scenarios. This is undertaken to anticipate and possibly manage the consequences. This position is, normally, congenial and familiar for a designer whose role in a debate or creative session is generally considered a contribution of ideas and input to be shared with the participants (Manzini, 2015; Meroni et al., 2018). In a thought-provoking approach, we can recognise the basis of what psychologists, as well as other practitioners, call "strategic conversations" (Nardone & Salvini, 2004; Ratcliffe, 2002).

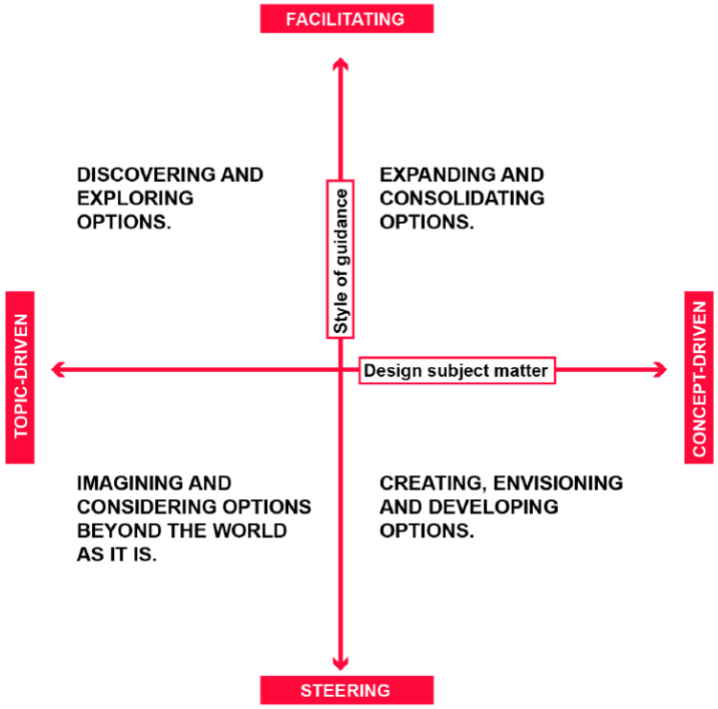

Image 1: The collaborative design framework (Meroni et al., 2018).

By polarising these two guidance styles, we can create an axis that visualises diverse ways to facilitate and run co-design activities. On one side, there is (designerly) facilitation, which mainly draws and builds on active listening techniques. On the other side there is (designerly) steering, which mainly adopts a thought-provoking posture of designers as experts in envisioning the future. The second axis focuses on the above-mentioned duality between topic- and concept-driven issues. The two created axes generate a framework of four alternative intentions of (designerly) facilitation, which can be used within a comprehensive design process, the collaborative design framework (see image 1). Within this theoretical framework, the FUTUReALPS process focused on the left side of the axis.

The student groups could start by using a first tool, the “strategic scenarios” matrix (Image 2), as a coherent representation of possible futures and plausible conditions relevant to strategies to build together. The workshop did not propose pre-established solutions. It was designed in an exploratory way with a set of variables and factors of change (STEEP: Social, Technological, Environmental, Economic, Political factors) to select. In practice, the students were asked to identify the most uncertain and most impactful factors relevant to the workshop theme. The steps have been as follows:

- analysing the factors of change,
- reflecting on those that could have the most significant impact on the dimension of possible uncertainty and
- ordering them and placing the two most uncertain and relevant on the axes of the scenarios matrix, in the combination of their plausible extreme 2040 conditions.

To make an impact and uncertainty more understandable, those pillars were described as the legs of a coffee table. If the leg of the table is removed and everything collapses, then the impact is high. The uncertainty is instead linked to the probability that one of the legs supporting the table could collapse. So, the least impacting factors are those that, even if failing, the business continues as if nothing had happened. These are not of particular interest to us. On the contrary, we are interested in the ones that

would put everything into play if failing. As for uncertainty, it is about understanding what might happen with a focus on the most unlikely events.

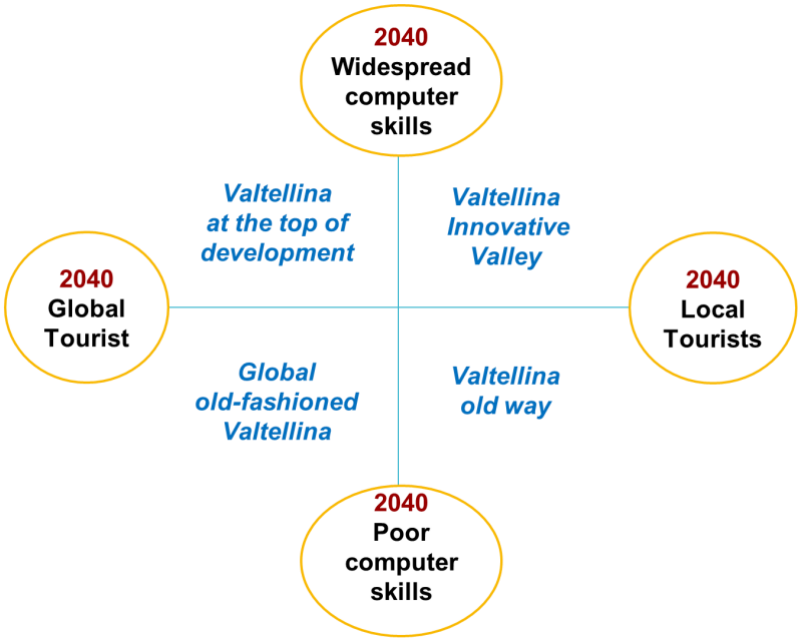

Image 2: An example of the strategic scenarios matrix, by students.

Each quadrant of the strategic scenarios matrix was briefly described as a future world. Then, students were invited to engage with exercises of visioning one of these futures, assuming a specific viewpoint. We assigned a personas profile to each group to help students reflect on the liveability of these "worlds" and wrote about the potential lives of the inhabitants of Valtellina 2040. Community organiser, mountain guide 4.0, Alpine blogger/influencer, sabbatical climber were just a few selections of the 70+ personas we used in the FUTUReALPS process. As belonging to students' different future worlds, these characters became 70+ senders of as many postcards from the future.

The results of the six workshops were various and articulated: here we report an extract of the results of the first one (25th September 2020) focusing on tourism. In that event, 93 students participated in the morning session, divided into 14 working groups. In their opinion, the most relevant and impactful uncertainties for local development are summarised in the following table.

Uncertainty factors	2040 plausible extremes	
Climate	Increasing damage from climate change	Limited damage in prepared communities
Connections and transport	The furthest areas are the most isolated	All the areas of Valtellina are well connected
Computer skills at the community level	Spread from the tobacconist to the mayor	Few can benefit from digital innovation for their own economic activity
Relations between innovation and tradition	Synergies	Conflicts and competition
Pandemic	The next is “managed” and not problematic	Other waves will surprise us unprepared

Table 1. Sample of uncertainty factors identified by the students.

The operators in the community lab, stimulated by the “postcards from the future” have identified some “intermediate goals” necessary to prepare the favourable conditions for the desirable 2040 scenarios, excerpted here:

- In 2030, tailor-made training for public administrators is periodically organised to work on long-term strategies;
- In 2030, positive outcomes of the 2026 Winter Olympics remain on the territory, enhancing local identity.

This codesign tool could be considered within the topic-driven/steering quadrant. This area of the collaborative design framework is about imagining and considering options beyond the world as it is. The collaboration aims at stimulating participants’ capacity to envision options beyond the usual way of doing things, thus challenging behaviours and conventions. The objective of the material used was to challenge and provoke the participants with unusual viewpoints, mind mapping or other creative practices, helping to steer imagination towards a “wow effect”. Functional or fictional role-playing activities help make all participants actively contribute to giving voice to weaker people, stepping into the others’ shoes, representing all viewpoints and leveraging expertise.

Each postcard, with its brief storytelling, has led to a challenge for 2040. Topic by topic, during the six workshops in the community labs, local representatives moved from these challenges to reflect on and develop a collective roadmap. Referring, once more, to the collaborative design framework, we underline that the community labs with citizens belong to the quadrant topic-driven/facilitating. This area is about discovering and exploring options. Collaboration is aimed at taking into account the needs and experiences of relevant stakeholders and users in order to capture their knowledge and/or engage them in the process (of visioning). Materials used in this context could be a series of tools to extract the experience, knowledge, desires and needs of users and stakeholders or to investigate the project and frame its fundamental assumptions. In the FUTUReALPS process, a specific radar scheme was the tool we chose for selection and decision making.

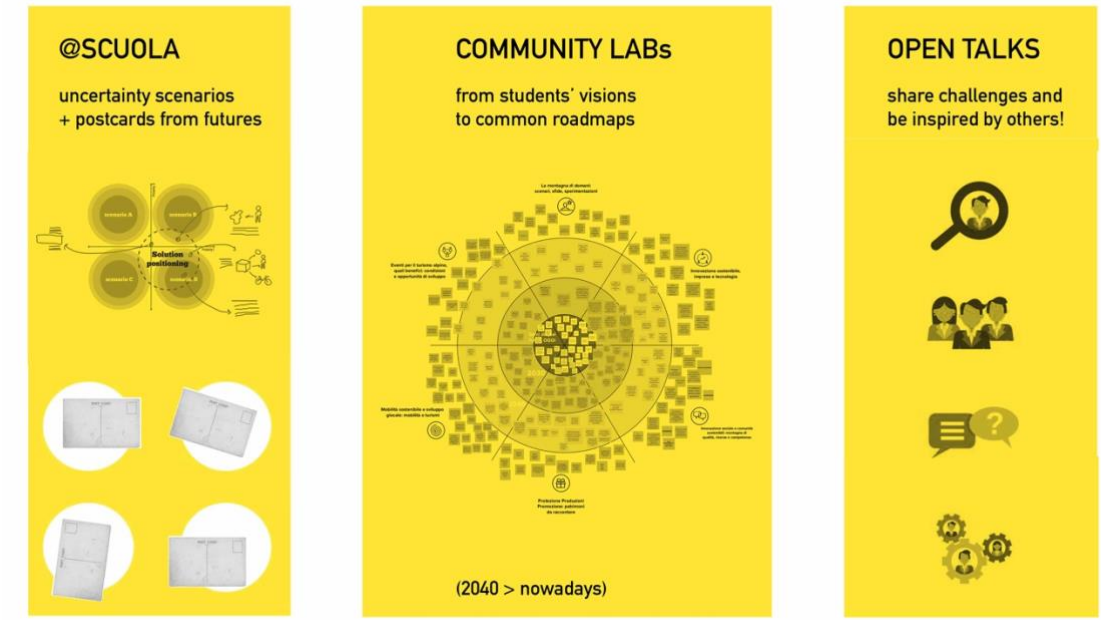

Image 3: Overview of the codesign toolkit for participatory foresight.

As the final step of each workshop, the evening open talk broadened both community vision and understanding to an Alpine framework with expert and academic contributions, thus acknowledging the ongoing process and bringing in social innovation practices from elsewhere. The added value of this final step consisted of both involving the general public as well as sharing participatory results with experts' views and perspectives.

Conclusions

The experiment is meant to continue with developments in different sectors (local communities and local schools) and geographies, also producing intangible results. These are about learning in terms of reframing the visions for local development and understanding the coming changes, not yet in terms of different decisions.

In terms of overall impact, it may be underlined that such a participatory process has been experimental in the area with such a considerable number of students and high schools involved. Teachers from the schools involved acknowledged that students really committed themselves, in such a particular and for many of them also complex moment due to the pandemic. It was meaningful to see that many groups of young people from the valley dared to think of a future that adults too often are afraid to envision and towards which they often look more disenchanted than hopeful.

Intergenerational dialogue represented a tool to be structured more thoroughly after this experimentation, with a call to ensure that what youngsters do not know depends on how adults communicate to effectively intercept them. Among the stakeholders, after the six workshops, it was mentioned that a community of intentions was created, with strong conviction that everyone shares the intent to proceed with planning in an open and glocal perspective; with a critical vision of how to design what awaits us by 2040, not linked to habits or "it has always been like that" but trustful and inclusive of everyone's interests.

Among the facilitating elements within the experimentation of "Montagna 4.0 FUTURe ALPS" lie the following:

1. The school has shown a formidable resilience in welcoming and actively participating in the process by strengthening the school's presence in the community, with enthusiasm on the part of the students involved, even in a time of great stress for schools.
2. The dimension of listening and focusing on young people as actors with a vision that interests the community about the future remains fundamental and has received interest to continue shortly to make it more structural in the area.
3. Looking at the stakeholders, the backcasting laboratories' effectiveness is closely related to the extent the actors involved are willing to play the game, thus being open to thinking about future scenarios ten or twenty years from now. This requires openness and willingness to question consolidated paradigms of local economic development and management.

We can take co-design as a paradigm of orientation, using its tools to "navigate" in a structured way: promoting ideas and visions on the one hand and enabling synthesis on the other. This endowment facilitates to "go beyond the present" as skills we focus on: the primary capability of forward-thinking communities. Their competence of future consciousness is substantiated in five key dimensions: temporal perspective, systemic perception in systems, attitudes behind each action, values and concern for others and openness to alternatives. Community-centred design, mixed with a futures studies mindset, therefore nurtured our experience to boost Alpine far-sighted communities.

Community-centred design requires that facilitators develop two areas of competence: the ability to learn about the community and its habitat and the power of creatively collaborating with non-designers. Civic engagement also helps to foster stronger relationships and trust across a local system, strengthening a society's ability to work together to achieve shared goals for the future. We refer to this collaborative design approach as community-centred design (Meroni & Manzini, 2014), which can prompt or feed the service design mindset (Meroni & Selloni, 2018) that is increasingly characteristic of today's creative communities (Meroni, 2007). Additionally, participatory practices allow Alpine territories to go beyond rhetorical or generic objectives of liveability and competitiveness and develop futures with a deeper awareness of local assets. The project revealed timely insights with the possible futures to draw specific actions to shape preferable outcomes. As the global pandemics challenged traditional paradigms, any change appeared to be possible, moving beyond centre-periphery in a polycentric approach calling for collective action to open up exciting futures to build.

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Understanding single-use plastic (SUP) during the COVID-19 lockdown through digital ethnographic research

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Abstract

How do people's interaction and behaviour change in a world where social contact is suddenly limited? How does ethnographic research change and adapt to new interaction rules? What can we discover through it? During the COVID-19 lockdown, we identified an extensive opportunity for digital ethnography (DE) to explore the evolving social worlds. As the starting point, this research aimed to inquire into the daily use of single-use plastics (SUP) consumption and disposal amongst the community that occupies UNAM's Posgraduate Unit through the design and application of a set of ethnographic analogic and participative tools. However, the COVID-19 world pandemic detoured our initial research plan and turned it into DE research. This shift required a change of theoretical contents into the comprehension and implementation of DE to rethink the field research. This article registers the adaptation of an ongoing project because of a disruptive event like a pandemic; through it, we want to share our experiences of using DE as a qualitative approach, insights about our project process and our predictive perspective about the growing problem we are facing with SUP.

Keywords: Digital Ethnography, Ethnographic Research, Lockdown, Single-Use Plastics, Design Ethnographic Futures

Introduction

We live in a world where digital interaction is a frequent activity in which we spend many hours, from sending a short text message to controlling smart objects. The most immediate example is the assembly of this article, quoting from digital sources, using digital tools for the study and analysis of the results, the collaborative writing and submission, as well as the contributions that came from different authors interacting behind a screen. This article was written because of a project developed at the Ethnographic Research Seminar in the Industrial Design Graduate School, and it was planned initially as a traditional ethnography approach but evolved into a digital ethnography study, which was fully developed during the COVID-19 lockdown.

For a better understanding of what digital ethnography (DE) means and encompasses, at the beginning of the semester we were familiarised with its predecessor, traditional ethnography. It is important to remark that in this paper, we agree on defining ethnography as "a way of practising research" (Pink et al., 2016, p. 21) in which data come from primary sources (people). DE relies on mediated contact with participants rather than an indirect presence. In fact, this approach "emerged as a response to the study of digital, mobile and networked media in everyday life, and it can be applied in different ways depending on the objective of the study" (Hsu, 2017, p. 41). We faced an opportunity because of the COVID-19 pandemic and used as inspiration the previous work and tools of DE researchers, such as "participant observation in digital contexts; delivering and communicating discoveries and research; or creating ethnographic databases" (Hsu, 2017, p. 41). We proved that "digital practices and technologies [...]

represent tools that offer a concrete step in the direction of a more participatory and inclusive ethnography, [...] more attentive to the establishment of a dialogue with the viewers" (Favero, 2017, p. 285). These ideas supported an alternative to go on with the research.

As different proponents of the approach argue, "there is not a unique method for DE, this research is methodologically innovative or 'mixed', transdisciplinary, empirical, contextual and cross-cultural" (Richardson & Keogh, 2017, p. 211). We used this quality as an opportunity to develop experimental research. DE is a tool for getting a deeper understanding of people's thoughts and behaviours using digital media as a link between their thoughts and ours. It is a new virtual magnifying glass for the investigator to zoom in on and dissect modern culture; "not limited to virtual ethnography, it focuses on how our engagement with digital media and technological interfaces configure and the ways we attend to communicate and, perceive" (Richardson & Keogh, 2017, p. 215).

The main sections of the article were named after the four types of DE practice, which so far have been identified and documented by digital sociologists (Lupton, as cited in Pink et al., 2016, p.24) and applied to ongoing research developed at the RMIT University Digital Ethnography Design Centre (DERC) and point out the steps we followed along our research process:

a. Use of digital tools to network and build conversations;
b. Research into how people are using digital media, technologies and tools;
c. Use of digital tools for analysis;
d. Engagement in critical analysis of the use and consequences of digital media.

Secondary sources research

This collaborative research began in January 2020 at the Ethnographic Research Seminar. Our group identified that pollution from SUP was a common interest amongst us, especially related to the daily practices of waste production and disposal in the postgraduate building.

"Until the last months of 2019, [global] public discourse was largely focused on environmental matters including climate change and plastic pollution" (Kistler and Muffett, 2019). Mexico was no exception, since on the first day of 2020 the "Solid Waste Law" banned the use of single-use plastics (SUP), focusing on plastic bags. However, "SUP does not only generate pollution in its disposal but in its production, each year the production, recycling and incineration of plastic items emit about 400 million tonnes of CO_2" (World Economic Forum, 2016).

To empathise during face-to-face classes, we applied research tools such as self-ethnographic photo diaries and concept maps developed individually and collaboratively. Through them, we identified that most of our garbage came from SUP, mostly used for food. This was our departure hypothesis, but we needed to open the scope to the postgraduate community to know more about their motivations and habits; therefore, in the way we were framing the topic, it was pertinent to use ethnographic research.

Field research planning

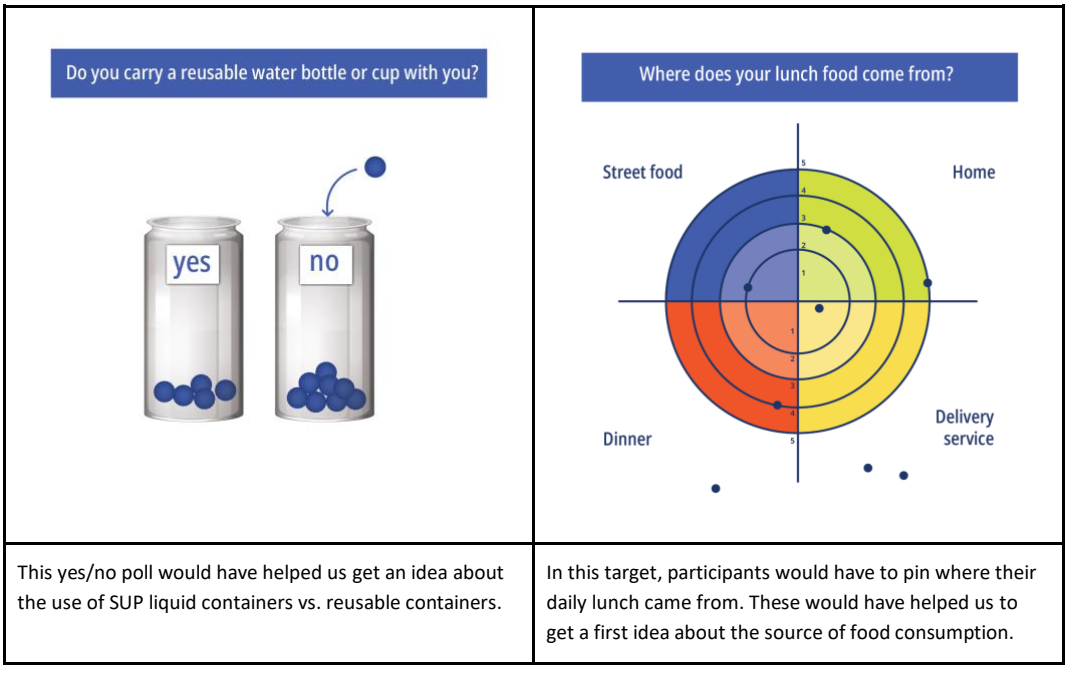
The first step was contextually setting the problem we had previously identified. We realised that the postgraduate building has the particularity of being geographically isolated from the other academic entities. Therefore, it does not offer the same amount and variety of food services as the rest of the campus. The postgraduate building has only one cafeteria, which does not always provide a satisfactory service to the members of the community. Then we ideated a way to ask the members of the community about the practices mentioned before with a series of analogical and participative tools to understand how

the garbage in the building is generated and disposed of, but also to know if the community was conscious about the pollution generated by SUP.

To get a notion of the SUP sources, we discussed the relevance of what and how to ask and agreed on the following questions, listed in Table 1, and designed illustrative ways to engage people interactively to collect their responses (see Figure 1).

Questions
How many snacks do you consume during the week? (Quantity and variety)
Where does your food come from?
How is your food packaged or contained?
Do you carry a reusable water bottle with you?
How many coffees do you buy in a week?
What would it take for you to stop using single-use plastic?
How do you classify this waste?
How could we generate less plastic waste in the Postgraduate building?

Table 1: Kick-off questions, before transitioning to DE.



This yes/no poll would have helped us get an idea about the use of SUP liquid containers vs. reusable containers.

In this target, participants would have to pin where their daily lunch came from. These would have helped us to get a first idea about the source of food consumption.

Figure 1: These are two examples of the designed analogic and participative tools. These interactive panels were supposed to be installed outside the cafeteria.

Adapting to the world's pandemic

"COVID-19 was implicated with the outbreak of uncommon pneumonia in the Chinese City of Wuhan, Hubei Province. The first cases were reported in late December 2019. Since then, the virus has spread to other Chinese cities, to other Asian countries, Europe and the rest of the world. Each nation implemented its own health strategies according to its contexts" (Samson et al., 2020). In Mexico, the first case was

confirmed on 29th February (BBC News Mundo, 2020), and the voluntary lockdown started on 23rd March 2020 with the countrywide campaign "*Jornada de sana distancia*" (Healthy distance campaign) to increase social distancing and reduce the speed of the virus transmission.

> *"This campaign, similar to other countries, included basic prevention measures such as frequent hand-washing and correct coughing, no social contact, suspension of non-essential activities, the reduction of access to public space up to 50% of its capacity and suspension of massive events"* (Animal Político, 2020)

Besides the national plan to deal with the pandemic, our seminar faced the administrative adaptation announced on 20th March, where "presence-based scholar, academic and administrative procedures and formalities were suspended until further notice, and each academic entity was responsible to adapt and preserve their activities" (Grauje, 2020). This situation caused the adjustment of our initial (traditional) ethnographic research, which at that moment was at the end of the planning phase, to a DE study. This approach sought "to radically transport, manipulate and reconstitute research materials with ease" (Hsu, 2017, p. 41), so all our previous work basis was adapted to the alternative research method.

This adaptation had to analyse and take into consideration the contextual particularities of the new (virtual) space within which we as researchers would interact with participants. One of the most important facts to consider was that traditional ethnographers immerse themselves in the world of their studied subjects, sometimes for long periods, to have a full comprehension of the studied phenomenon. The constant presence of the researcher in the subject's physical space enables trust and comfort between them, giving the subject ease to naturally behave in their context.

In this case, it was recommended not to interact personally with our participants because of the situation, so we faced the question of how these spaces transform in DE. Cultural geographers contend that space and place are constructed culturally, suggesting that spatiality can form online. Although "online communities exist as legitimate places and, conversely, place-based communities exist online, such as national publics, regional networks, and local ways of living" (Kraemer, 2017, p. 180), both "production and construction of space are mediated by social processes, especially being contested and fought over for economic and ideological reasons" (Low, as cited in Kraemer, 2017).

To avoid the debate aroused among digital context researchers about "the extent social worlds that involve digital elements are reducing, increasing or changing social life and its consequences" (Pink et al., 2016, p. 130), in this article we agreed with defining the social world as Pink et al. do, namely "a neutral, heuristic concept that invites empirical investigation and comparative analysis. Though this definition is highly polysemic, it comes with fewer moral or normative strings attached" (2016, p. 149). This enabled us to discuss the use of social media platforms during the pandemic's first weeks and identify the proper "space" that would facilitate the path of meaning making (Favero, 2017, p. 284).

Covid-19 and the plastic use context

With the growth and evolution of the pandemic, the hierarchisation of plastic use changed from sustainability to self-preservation; inevitably, SUP became a major issue. Decision-makers turned in favour of the use of SUP, and local policies were revoked. There was no time to prevent the urge for using plastics, and this has overtaken any sustainable initiative. The first hint was our seminar discussions on how some of us tried to keep ecologic practices, and food providers limited our options to pre-packed versions of products that a few weeks before you could have bought in bulk. Our research participants shared similar

experiences, and finally, worldwide news photos of face masks littering beaches and reports on general poor waste management reaffirmed our hypothesis on how the COVID-19 emergency left no space to discuss SUP control.

> "*This phenomenon was not related to Mexico; in Europe, stakeholders that have a role in decision-making, shifted their perception on environmental care, with concerns related to the COVID-19 outbreak …*" (Grodzińska et al., 2020).

> "*To maintain health safety standards, sanitization SUP became a must in everyday life leading to a shift in value hierarchization …*" (Bardi et al., 2009; Homer & Kahle, 1988, cited in Grodzińska et al., 2020).

Shifting from analogical to digital ethnographic research.

Amid the COVID-19 pandemic context, all face-to-face classes were suspended, and the application of the interactive research tools that we had designed was cancelled. Nonetheless, shifting to digital ethnography was more than a remedial measure, as Postill (2017, p. 67) states:

> *"… it is a "second best" choice for [researchers] unable to reach their field sites for reasons of safety, illness, or disability. It often helps us to observe familiar people and things from a different perspective, thereby creating a richer engagement with the worlds of our research participants".*

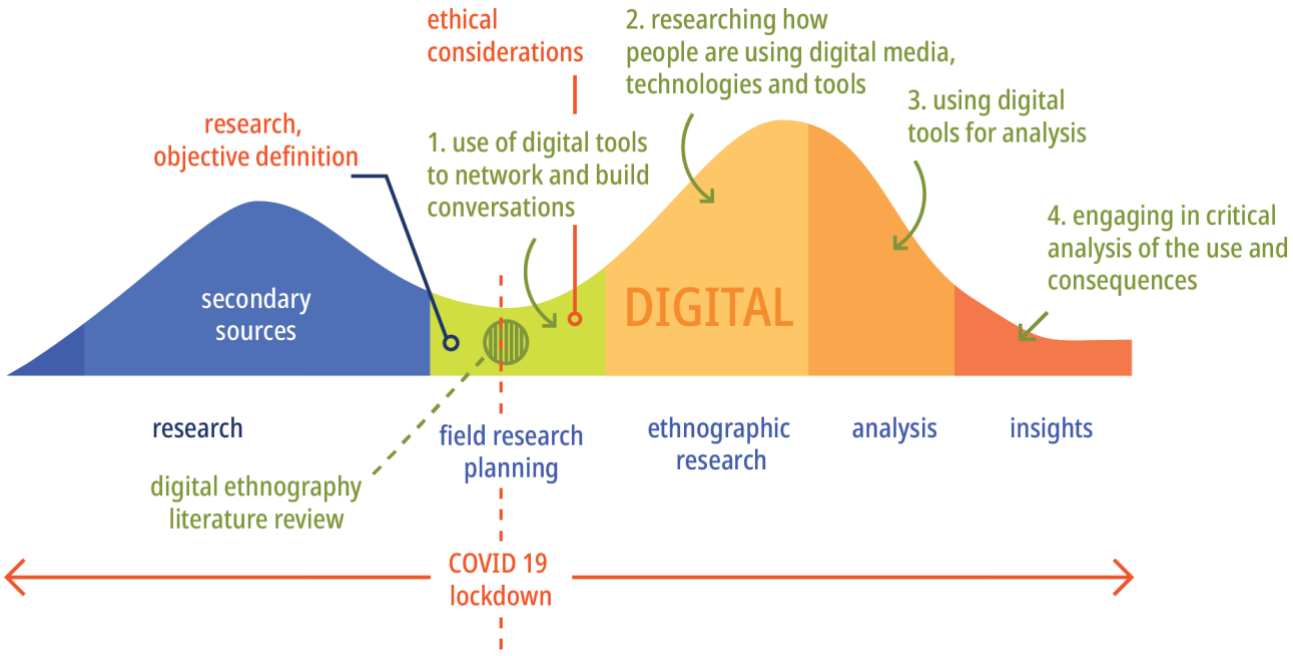


Figure 2: Research process and tools timeline.

Use of digital tools to network and build conversations

There was no doubt about the potential that the Internet has for mediating contact with a community; thus, we decided to overcome this situation. On our first Zoom meeting (our alternative workspace), new inquiries and questions related to the initial food packaging waste topic arose, which led us to adapt our objective to inquire about the use of SUP, its consumption and disposal practices during the quarantine and to design the remote field study application.

An example of how our initial questions from the analogue research evolved to the digital version was, “Where does your lunch food come from?” Depending on the answers (delivery, dinner, home, restaurant, or street food), we would get insights into how many of these meals produced plastic waste. In the Facebook group, we asked how many delivery services our participants had ordered during quarantine time (April 2020), where they were buying their groceries and how they arrived at their homes.

In this transition to DE, we planned the research process collaboratively through Google slides, as Figure 3 shows. Also, the activities we initially had in March were modified in this process, as shown in Table 2.

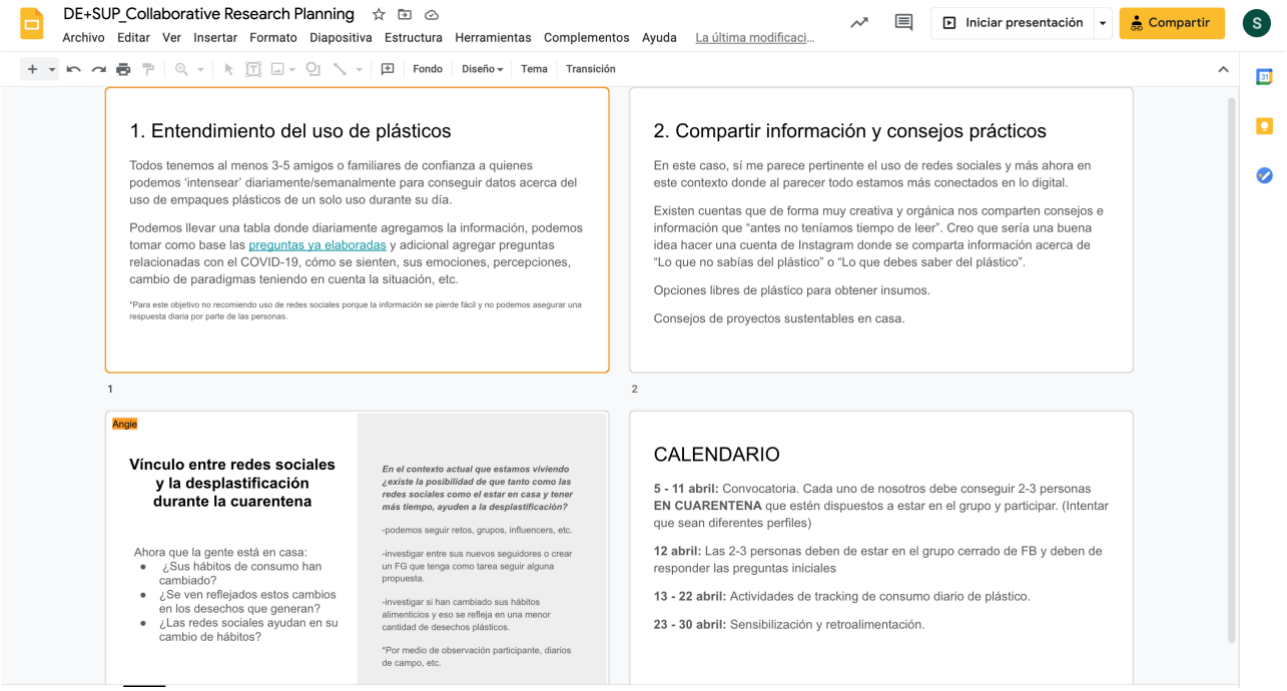


Figure 3: Collaborative research planning made by the research team in Google slides.

Researching how people are using digital media technologies and tools

Once the new objective was stated, we evaluated the platforms that could help us. According to Favero (2017, p.276), “interactive platforms can function as a tool for generating new multimodal and participatory ways for both displaying and producing ethnography”. Facebook Groups was the chosen platform because “during quarantine, people were using more than usual social platforms and Facebook is still the most used one” (Statista, 2020; New York Times, 2020). We chose the Groups feature, so that we could have a small community answering one question/activity per day, and the posts would remain there for as long as we needed. Also, posts would appear in the participants’ feeds, and, if they forgot to answer, we would be able to remind them through private messages.

Activity / Question
A1 (Google forms). Hi! Could you help us to know you by filling out this form?
A2 (FB poll). Since lockdown started, how many delivery services have you ordered? Mark you Ranswer in the poll and specify in the comments what you ordered.
A3 (FB post). Could you share on this post a description, photo or video of what you used to prepare your breakfast, lunch or dinner? Try to show the product's packaging. Thank you!
A4 (FB post). Could you help us understand how groceries arrive at your home? If possible, share a picture in the commentS section of this post (It does not have to be from today; it applies to the day that you ordered or from the day before). Tell us, where are you buying your groceries?
A5 (FB post). During lockdown, haVE your food expenses increased or decreased? Could you comment on why or how?
A6 (FB post). During lockdown, has your online shopping increased or decreased? In what kind of packages were they delivered and what did you do with them?
A7 (FB poll). During lockdown, which of these products have you bought? Please comment on how many of each.
A8 (FB post). What would you do if the garbage truck stopped working?
A9 (FB post). During lockdown, have you noticed an increase in your single-use plastic-wrapped food consumption? Which ones? If it has not increased, what are the containers or wraps of your food?
A10 (FB post). Please share with a comment what could you do to decrease single-plastic consumption during a lockdown.

Table 2: Activity planning: the order of the questions and the platform features were decided among the researchers.

Even though Facebook Groups, comments, polls and the possibility to upload pictures was helpful, this platform did not allow us to collect all the responses in the same database to make the analysis easier phase, so all responses were captured manually in Google Sheets (Figure 4).

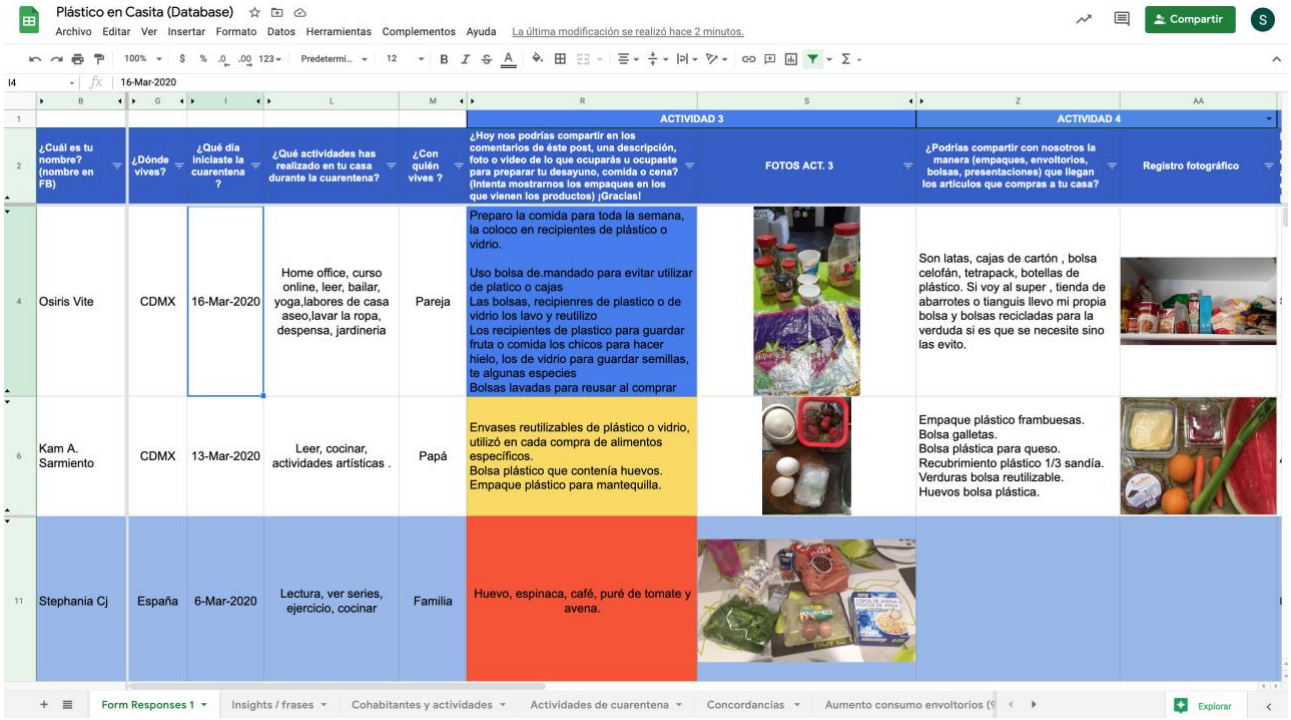


Figure 4: Google sheets database generated from the feedback provided by the participants in the Facebook Group.

Using digital tools for analysis

As mentioned above, we invited participants from our social circles that we knew were staying at home during the quarantine and had a Facebook profile. Thus, we had the confidence to remind them to participate if they had not answered activities. DE broke the geographic barrier, so we were able to collect answers not only from different states in Mexico but also from Medellin, Colombia. Our population turned out to be almost evenly distributed between men and women, with an average age of 35 years. Contact with participants, as well as between ourselves, was digitally mediated the whole time.

While inviting our participants, we encountered the ethical considerations of making the objective or motives of the investigation clear at the beginning of this study. This made participants trust the research but, at the same time, it could alter the outcome of the research, predisposing participants to respond the way they thought researchers wanted to. In particular in our research, we briefly explained the motives and reasons behind this study to the Facebook group members. Also, we created a visual image to present the research with proper formality and uniformity (see Figure 5).

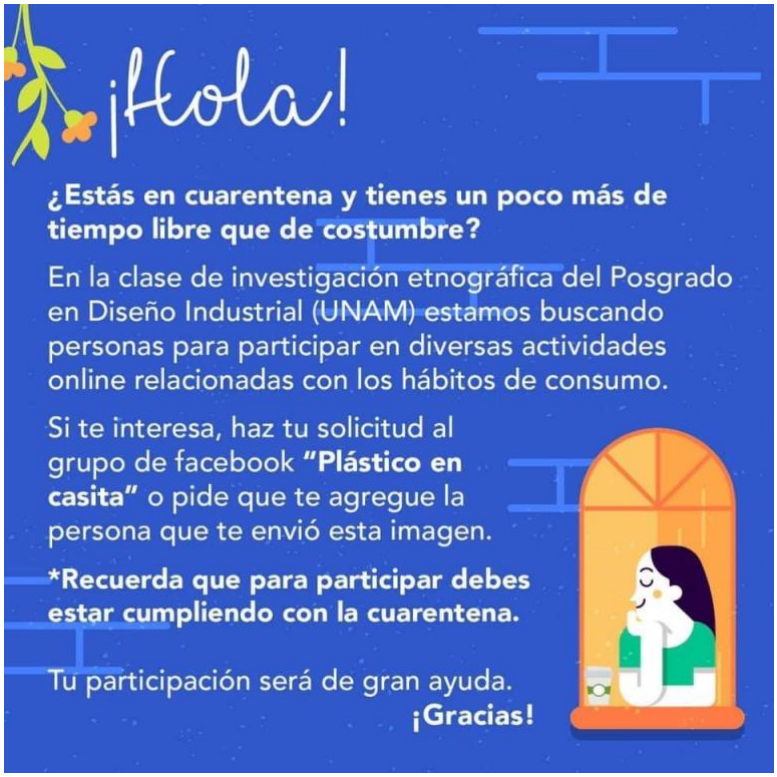


Figure 5: Banner used to invite people to join the Facebook group "Plástico en casita" [plastics at home].

DE research on Facebook included activities like polls, narrative comments, and photographic evidence. These resources, according to Favero (2017, p. 276), are multimodal, material, and relational items; the task we had as researchers was to recover ethnographic evidence, awakening the conversation with participants to deepen insights on the material they were sharing with us.

At the end of the activities, the information we received from our participants was as follows:

- Most of them had ordered home delivery 1 to 3 times during the first month in lockdown.

- The most consumed product categories were prepared food, groceries and home accessories or toys. All of them were contained in SUP packages and wraps.

- Supermarkets and retail companies were their first point-of-purchase choice, second were local public markets and third the local convenience store. Participants who got their groceries in supermarkets declared that they acquired more packaged products than before lockdown. Participants who got their groceries in public markets and local convenience stores still used market tote bags.

- A significant number of participants reported that their food expenses decreased because they began to eat fewer meals a day and prepare them at home. On the contrary, there were also cases where food expenses increased due to a rise in food prices and food anxiety-related disorders, as mental health was undermined for some.

- The most consumed COVID-19-related products were facemasks, hand sanitiser and medicines.

- The participants considered changing their consumption habits and implementing reuse and recycle practices when asked to imagine a scenario where the garbage recollection truck stopped working. This question caused surprise and some distress in them.

- The participants proposed reducing SUP use by being a responsible consumer and adopting practices like buying in bulk, avoiding purchases of products contained in SUP and the use of market tote bags.

At the beginning of the research process, some participants asked for the results. We interpreted this as a sign of interest in the topic and engagement with our research. The research team decided as an ethical principle to share with them not only our findings, but also extra information related to the discoveries on the Facebook group, as shown in Figure 6.

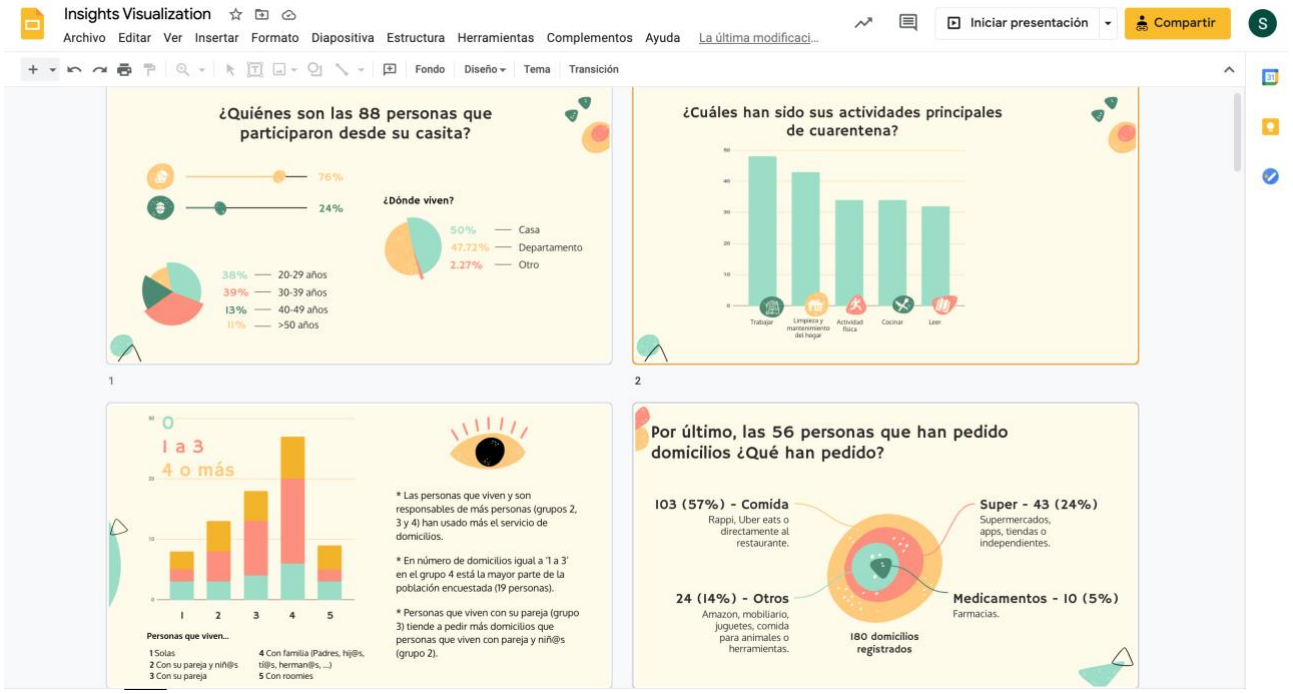


Figure 6: Insights—visually expressed—shared through the Facebook group.

It was interesting to witness how a community started to develop among participants who, at the beginning, did not know each other. From their public answers, they started identifying what tips they could share and to inspire each other on different projects like composting or making eco bricks.

One of the emergent aspects of this research was the co-evolution of the participants' responses from their appraisal of others' comments in the group. Then, a participatory experience and construction of common knowledge emerged. We identified that participants might have started to feel insecure about revealing their true practices since they began to reshape their answers as activities went on during the field study application, making each response more detailed and supported by photographs. We also wondered if there were participants who abstained from answering certain activities because they felt embarrassed due to how they handled SUP.

Our interpretation

To start envisioning future design opportunities and different scenarios, we mainly reviewed the work of Akama, Pink and Fergusson (2015), who proposed a framework for studying futures that combines ethnographic research with various disciplinary practices like design research, to provide a step sideways and to depart from traditional approaches in DE and Human-Computer Interaction (HCI) and named it Design + Ethnography + Futures (DEF). This approach creates a different way to consider design opportunities to trigger change-making initiatives and change behaviour.

The DEF framework has been applied before in workshops, but we adapted it to our research, helping us to explore people's cultures and the human capacity for improvisation in an emergency state involving the use of SUP, as well as to recognise uncertainties that could help us foresee how possible future scenarios might emerge. Regarding this, Akama et al. (2015) remarked:

> *"Our interest as designers and researchers has relied on understanding and creating change, working with emerging qualities and with people with whom we share journeys into the immediate future and that we have always been oriented towards future making and willingly embrace the unexpected".*

We combined the DEF framework (Akama et al., 2015) and the previously mentioned four types of practice (Pink et al., 2016) to develop the interpretation phase. To accomplish this task, we used the Miro app, a collaborative whiteboard that enabled our team to work in real time, organise data and identify design challenges in the immediate future, as shown in Figure 7.

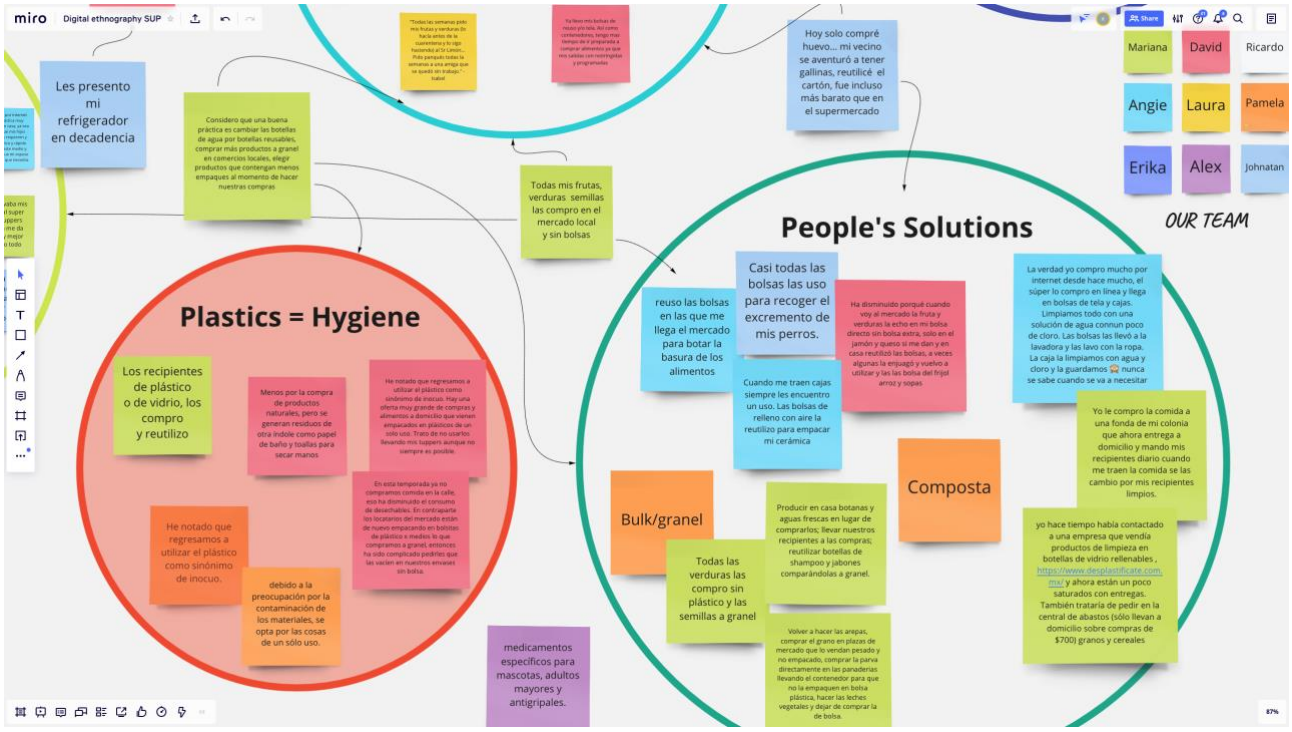


Figure 7: Using the DEF framework in Miro to find patterns, make connections, interpret answers, and visualise dynamics or tendencies.

Engaging in critical analysis of the use and consequences of digital media

At the end, we obtained various conclusions:

- About design research tools, there were some mistakes while formulating questions; some participants commented that they did not reply to some activities because they did not understand either the question or the instructions. As questions were formulated in language open to participants' interpretations, they answered according to their understanding. This bias might have led to the loss of some information.

- About the research progress, researchers should encourage participants to tell their stories and promote fluid communication. We realised that enriched storytelling from participants reflected the trust they had in the research team or goal.

- About replacement of physical interaction, there must be compensation for the limitations of participant observation, not only through the narratives but also with images or photographs that support it. For the photographic analysis, the researchers must develop a trained eye to understand the context, situations, interactions between objects and humans and ways of living reflected in the picture. By asking participants to take a photo of their daily consumption and to tell us about what they bought, we discovered useful insights about plastic consumption, behaviours and future design opportunities. Sharing insights with participants so that they could have certainty about how we used the elicited data reinforced their confidence in how their answers were used.

One of the most important findings we restate is the importance of empathy as a skill for ethnographic studies to understand people and their relationships with life and their own view of their worlds. Amid COVID-19, this was important for our remote field research because empathy became a constant reminder to keep a critical point of view about the complexity of timing and situation while research activities were developed.

Possible future scenarios

As an outcome of the DEF approach, we agree with Pink (2020) that to overcome future ecological and health crises, society should adapt and benefit from digital connections to reduce their ecological footprint. Under this premise, we worked on the creation of different future scenarios to explore design's opportunities regarding possible future crises, such as:

- New business models for industries, distinct service solutions, new payment options, communications and learning solutions.
- Business guaranteeing the cleanness-related values people have for SUP while reusing, recycling, and reducing its consumption.
- How new human interactions emerge and change against the modification of one's objects.
- Transformation of public spaces and transportation.

We used the Hitachi Foresight North America 2019 card set, developed by d-lab (2019), which condenses emerging trends in economics, society, technology and politics; this tool was used to provoke conversations—amongst our research group—about the future of SUP. For this article, we chose to present only as an example the outcome related to the "plausible scenario" (Voros, 2003), where current

knowledge could happen, the context remains the same, opportunities are maximised, and threats are minimised.

In this scenario, we used the "devastating inequality" (dlab, 2019) trend to think about the SUP future consumption problem. The departure point is context, where we observed through DE research that household consumption has a strong tendency to use SUP to deal with the pandemic problem. This consumption behaviour in the healthcare context has also increased.

The opportunities lie in:

- New recycling processes, as well as safe disposal programmes that diminish exposition risk to the people that manage the residuals. There is a broad opportunity for design to develop new material alternatives that aid to keep cleaner and healthier practices—this was a common perception about products wrapped in plastic among research participants. The threat we should minimise is long-term responses due to emergency situations, in reference to the gap between knowledge and implementation.

- Changing consumption habits and reducing SUP consumption were also enunciated during the research process. The DEF framework led us to think about the imperative shift from consumption towards an ethical economy (dlab, 2019), where consumers are no longer blindly loyal to brands but make their purchase decisions based on how a product or service is made of and what it stands for. To achieve this scenario, companies should realign their brand, act with transparency and be empathic to current situations such as the pandemic. A trend to link to new consumption practices and be considered a serious opportunity is "tailored services" (dlab, 2019), which must be regulated to not provoke quick production, delivery and hyper customisation but nonetheless, at the same time, make the shopping process effortless, involving fewer steps.

- Regarding digital interaction, current evidence shows that mediated contact with people will keep growing, not only during emergencies like the COVID-19 pandemic but also to get closer to long-distance communities and thus enrich knowledge through new interactions or even to reduce urban mobility. Somehow this will lead to the development of "adaptive cities" (dlab, 2019) where infrastructure will be responsive to resident's needs and changing conditions. In adaptive cities, change will be anticipated in modular and resilient ways that are modifiable whenever needed. Due to the pandemic, we put into practice adaptive conditions; schools and students had quick adaptation to provide personalised on-demand services and promote flexible learning of contents and new skills. This tailored service has been aided by online platforms, apps and teleconferencing, making learning multimodal.

Conclusion

The pandemic triggered a quick migration from the in-person world to the digital one. Though digital ethnographic research is a work in progress, it has been in development for at least 20 years, but under lockdown conditions it has represented an important tool to go on with certain research projects.

Our project adaptation benefited from its virtues (budget friendly, inclusive and facilitating collaboration) and enabled us to establish communication with our participants and with our teammates.

Research discoveries led us to think about alternatives that could optimise the ongoing dynamic and mitigate negative effects into positive social changes in domestic and commercial SUP consumption. But

at the same time, the futures approach pointed out the urgency of developing handy waste management systems, which enable users to efficiently separate household waste and promote specialised collection systems. Furthermore, regarding SUP consumption, we found an opportunity to recycle cardboard and paper produced by courier, package delivery and mail services, which has been intensively used during pandemic lockdown.

Everything learned during the DE project and the obtained findings are currently being used for exploring possibilities to properly conceptualise and design innovative and emergent solutions that use waste materials to face problems such as land degradation and food safety.

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CraftDesign for entrepreneurship, social innovation and sustainability

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Abstract

Crafts, under the umbrella of the cultural and creative sector, represent an important contribution to social development and cultural freedom. Entrepreneurship through crafts and design brings a strategy to promote the empowerment of vulnerable communities. Given the challenges our society is and will be confronting in the 21st century, such as the climate emergency, the process of digital automation in the human workforce, emergencies such as natural disasters or protracted crises, as well as the socioeconomic crisis that will follow the COVID-19 pandemic, scientific knowledge on policies and strategies aimed at promoting sustainable development and ensuring the equality and social inclusion of vulnerable communities should be strengthened. This paper reflects upon the role crafts design and entrepreneurship can play in promoting sustainable development.

Keywords: CraftDesign, Entrepreneurship, Social Innovation, Sustainability, Women´s Empowerment

Introduction

Cultural and Creative Industries (CCIs) have their source in individual competencies, creativity and skills and are a potential vector for creating employment and wealth (United Kingdom Crafts Council, 2014). At the European level, CCIs represent around 4% of European GDP and provide jobs to eight million people (Addarii, & Lipparini, 2017). In terms of European policy, important strategies, and programmes such as Creative Europe have been launched to reinforce the belief that culture and creativity are basic factors for personal development, social cohesion, economic growth, employment creation, innovation and competitiveness. The new creative economy opens the door to the recognition of the intangible values of creative processes and new business models. In parallel, entrepreneurship might represent an opportunity to achieve social, cultural, economic and environmental goals, and design might play a strategic role in promoting sustainability by introducing innovative solutions to social problems (Sambade & Ferreira, 2017).

Beyond the contribution to the economy of the CCIs, these sectors trigger spillovers in other areas like education and social inclusion through their contribution to soft innovation (Stoneman, 2011) and bring relevant tools for enhancing intangible cultural heritage and cultural freedom (Sen, 1999). Amongst the activities included in cultural industries, crafts play a key role. The craft economy generated £3.4bn for the UK economy, accounting for 0.3% of its gross value added (United Kingdom Crafts Council, 2014). Also, crafts bring relevant tools for promoting cultural diversity and supporting the social inclusion of vulnerable groups such as women, internally displaced people (IDP), senior populations or communities in development at the local level (OECD, 2018). Although crafts represent an important contribution to the economy and society, less attention has been paid to them by statistics and research in the field of creative industries, except for countries strongly supporting the creative economy like the United Kingdom and Australia where the research on crafts is particularly evident.

One of the objectives of the 2030 Agenda for Sustainable Development is to reduce the gender gaps and increase women's participation in the economy globally, as women have less access to the labour market

(United Nations General Assembly, 2015). Women's participation in the global labour force rate is 48.5%, which is 26.5 percentage points below the rate for men (International Labour Office, 2018). Giving them the opportunity of developing their own businesses and empower them at the social and cultural level, other key dimensions of human development, is essential to support human sustainable development.

Across the world and for centuries, women have nurtured cultural heritage (United Nations Industrial Development Organization [UNIDO], 2013) by preserving traditional techniques, generation after generation, and enhancing traditional designs. Nowadays, on the one hand, women are playing an active role in the awakening process of crafts as creative entrepreneurs (Dupon, 2011). For example, craftswomen represent 61% of artisans recognised in Portugal. However, there is a challenging lack of gender-based statistics related to crafts, and it is difficult to find gender-based indicators in terms of equal access and participation in the sector. Some research has focused on crafts as a vehicle for feminism and activism and recognises the voluntary return of women to traditional crafts as the third feminist wave (Offensend, 2012).

At the same time, for some years now, the number of artisan women entrepreneurs making handmade products is increasing, surprisingly. Most of the practitioners of the new craft who are working laboriously and passionately, experimenting with history, vision and feeling to produce high-quality modern and desirable objects of creation, are women. In the context of an economic crisis, the path of crafts may have offered professional opportunities to women who became unemployed or suffered professional discrimination in the labour market (D'Ippoliti et al., 2013).

Moreover, initiatives being implemented worldwide are using entrepreneurship and design as strategies and methods to bring sustainable change and promote the empowerment of communities (Bernarda et al., 2017) and the inclusion of social groups in vulnerable conditions, especially women from rural communities, senior populations, and people who have been forcibly displaced or who are at high risk. Initiatives aimed at strengthening women´s cooperatives, promoting women's networks and building women´s capacities in community leadership and business management are some examples. In this respect, international organisations such as the UNIDO, the United Nations High Commissioner for Refugees (UNHCR), the United Nations Development Programme (UNDP) or the United Nations Educational, Scientific and Cultural Organization (UNESCO) are also an interesting source of data and knowledge on how a creative economy can bring development. The report Gender Equality. Heritage and Creativity, published by UNESCO in 2014, brings important reflections to how cultural heritage and creativity can carry gender equality.

Research questions and hypothesis

Entrepreneurship through crafts design empowers collectives at risk of social exclusion, such as refugees, migrant women, rural communities, indigenous groups and senior populations. The combination of creativity and social innovation might respond to complex challenges, such as a future of labour automatisation, increased inequality and global interdependence.

The interest of research on the role of crafts and design in supporting social innovation and change aims at identifying strategies to invent meaningful value and solutions to solve the wicked problem (Buchanan, 1992) of the social exclusion of vulnerable groups. The proposed research will apply a design-oriented research approach to allow the investigation to integrate design as part of the research process and develop research through design.

"… Craft has a huge potential to contribute to sustainable development in developing countries. It is labour intensive, it comprises a substantial part of the economic fabric of developing countries, and it has the potential to dovetail with the information revolution's knowledge and creative economy to access new and lucrative sustainability-aligned markets. For these reasons, it provides developing countries with the opportunity to side-step the generic development paradigm, provided it can dovetail with the innovation-led, value-added, and manufacturing-oriented paradigm…"
(Reubens, 2019, p. 99)

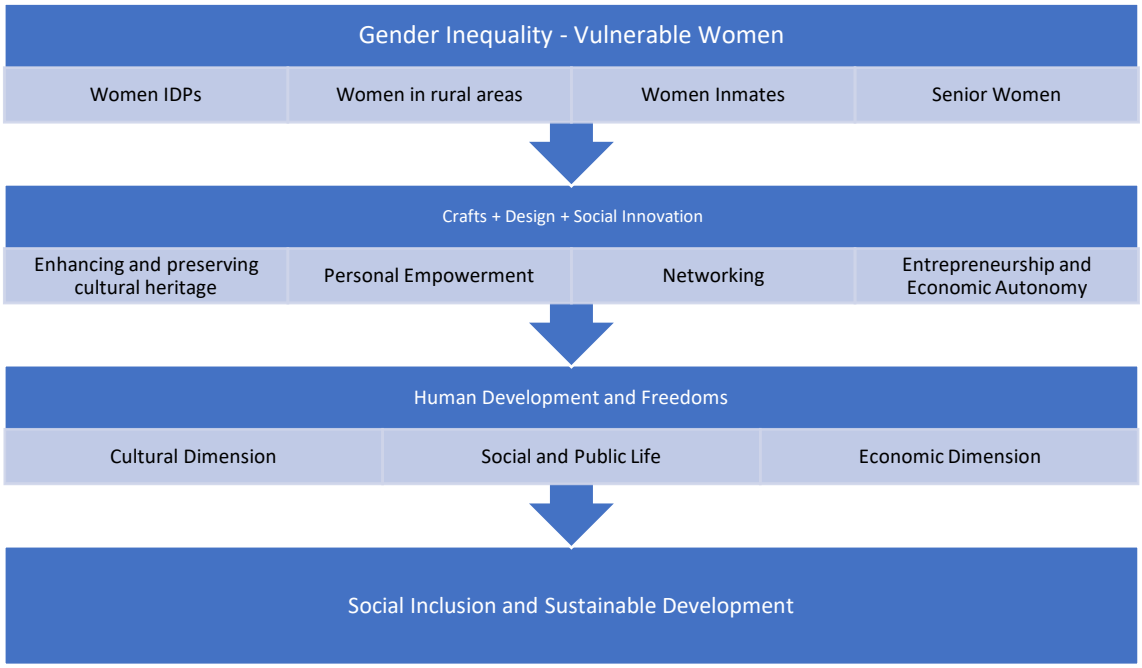

Table 1: Problems | solutions tree process analysis.

Taking these challenges into consideration, the research aims at finding responses to the following questions and project interests.

- Are crafts a powerful vector of social empowerment and economic autonomy?
- Are women at risk of social exclusion one of the groups that might benefit the most from this sector? If yes, why and how?
- Which role should design play in the development of artisanship as a strategic sector? What about information and communication technologies?
- What are the best practices or social innovation methods to follow in this process?
- Which stakeholders should be involved?
- What are the cultural impacts of promoting crafts as a strategic sector?

Other specific questions considering the interdisciplinary nature of this research that might allow the development of the study are:

a) The concepts of crafts, design and craft design:

- What are the more relevant disciplines of crafts being used by women? Is there a mutual understanding about the perception of crafts?
- How is the role of design perceived by craftswomen?
- Have craftswomen the same status, legal or informal, and social recognition everywhere?

- How do craftswomen perceive themselves: as makers, crafters, designers, artisans, entrepreneurs or artists? Is there any distinction related to their social status, cultural identity or geographical location?

b) Social leadership and participation in the community:

- What tools are used by craftswomen to promote their work?
- Do crafts strengthen women´s social leadership? If yes, on what terms?
- Is there an informal network of craftswomen being developed on social media platforms?
- What mechanisms are used by craftswomen to participate in the community of crafters?

c) Conciliation of professional and family life, economic independence, business sustainability and skills:

- How do women get the necessary training to work as artisans?
- What is the spatial–organisational format used by craftswomen?
- Under which labour conditions do craftswomen develop their work?
- Are we talking about a full-time job or a part-time job? Or becoming a crafter in second life?
- Are crafts providing a professional career and long-term economic autonomy to craftswomen?
- What are the challenges craftswomen face in terms of sustainability, marketing, market and internationalisation?

d) Cultural rights and participation in artistic and cultural life

- Do craftswomen perceive their work as the transmission of knowledge and heritage dissemination?
- Do women feel that they are promoters of dialogue between cultural heritage and design? And what about cultural diversity and cultural identity?
- Are women playing a key role in craft heritage transmission and enhancement nowadays?

Research plan and methodology

The interest of the research on the role of crafts and design in supporting social innovation and change aims at identifying strategies to invent meaningful value and solutions to solve the wicked problem (Buchanan, 1992) of social exclusion of vulnerable groups. The proposed research will apply a design-oriented research approach to allow the investigation to integrate design as part of the research process and develop research through design.

To find responses to these general and specific questions, the proposed research project is structured in three investigation phases that will combine interdisciplinary approaches in the areas of crafts, design, entrepreneurship and women´s empowerment and the methodologies of ethnographic research, good practices analysis and applied research. Regarding vulnerable women, the research will consider different challenges confronted by women at risk of social exclusion (unemployed, forcibly displaced and based in rural communities). It will follow collaborative principles and use ethnographic and empirical research (literature analysis, surveys and interviews), fieldwork observation, good practices analysis in cooperation with social innovation initiatives and applied research through collaborative workshops and self-experimentation.

The use of crafts and design as a driver of social change is an approach being used by international organisations such as UNHCR to promote IDP's social integration in several refugee camps, as well as by UNESCO, United Nations Conference on Trade and Development (UNCTAD) and UNIDO in developing

countries. Associations such as La Fabrique Nomade (France), the Refugee Company (Netherlands), Cucula Design (Germany), Ragamuf (Finland-Turkey), Oloop Design (Slovenia), SEP (Jordan) and even the project MADE51 by UNHCR, amongst many others, are using this approach to promote refugees' integration. Initiatives such as Pet Lamp (Spain), Carpet of Life (Belgium), Ishkar (UK-France), A avô their trabalhar (Portugal), Ferramenta (Portugal), Tejiendo la Calle (Spain) and Reklusa (Portugal) also strategically use this approach to support other vulnerable groups such as indigenous communities, people living under protracted crisis, migrant women, senior women, rural women and women inmates. On the other hand, through the analysis of women entrepreneurs in the fields of crafts experiences, we would be able to better understand the challenges and impact at the social, economic and cultural level of developing a career in the crafts sector. Their testimonials will be used together with interviews, focus group reports and questionnaires to complement insights identified with other methods. Finally, collaborations with social innovation initiatives supporting vulnerable communities at risk of social exclusion and women artisans will be implemented to understand the business models implemented, the creative processes followed and the impact achieved.

The findings and outcomes identified from the three phases of hand methods of data analysis used will be analysed and used to elaborate on the role of entrepreneurship through crafts design and how it can contribute to social inclusion and empowerment. The findings will serve as a reference for designers, institutions, organisations and companies who wish to promote the empowerment of collectives at risk of social exclusion through crafts design and contribute to the knowledge in the fields of entrepreneurship, design, crafts and sustainable development.

Research plan stages and objectives

1st stage

First, a confirmatory approach will be applied to conceptualise the research and review and confirm the theoretical foundations, the purpose and the research questions (state-of-the-art). Expected timeline: Q1–Q4 | Semester 1 | Year 1.

2nd stage

In the second stage, the research will follow exploratory methods to analyse craftswomen's perceptions and collect pertinent data from their experiences as entrepreneurs. In this regard, identification and study of case studies (preliminary case studies identified in the research plan and methodology plan) in Portugal and other countries through residences, travel or participation in international seminars as well as applied research through collaborations and self-experimentation with initiatives and entrepreneurs in Portugal will take place. Expected timeline: Q3–Q8 | Semesters 2–4 | Year 2.

3rd stage

Third, the data will be interpreted, and conclusions will be drawn based on quantitative and qualitative indicators reviewed to gain an overview of common findings, challenges and differences. Conclusions will be disseminated as concrete output in the form of a toolkit and/or guidelines depending on the consultations maintained with stakeholders and end-users. Expected timeline: Q5–Q12 | Semesters 4–6 | Year 3.

Further research

To bring entrepreneurship and design to crafts as strategies and methods to promote social innovation and the empowerment of vulnerable communities, the work plan proposed will allow us to achieve relevant

steps for the investigation in terms of boosting social-based and interdisciplinary research in the field of craft design for social change, providing evidence on the association between crafts and women´s empowerment, as well as strengthening the scientific knowledge and practice of researchers in the field. In this regard, next to the conclusion of the literature review and the development of the state-of-the-art, exploratory methods and ethnographic research will allow us to identify and analyse case studies. In this phase, the analysis of craftswomen's perceptions as entrepreneurs as well as the development of collaborations with initiatives from a self-experimentation perspective will also be a relevant source of data and information.

Finally, the data and findings will be analysed to share the best craft design-based models of entrepreneurship with institutions or individuals who are involved in the promotion of women´s empowerment and crafts development as well as committed to the promotion of social innovation.

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Emancipation and creativity atlas: Participatory art and design, the societal image

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Abstract

Participatory art and design is an eclectic domain and an increasingly relevant trend. We have been witnessing the profusion of projects of an activist nature, simultaneously informed by ethics, aesthetics and politics, which aim to benefit society. Encouraging the social and cultural sustainability of citizens living in disenfranchised residential areas by developing their creativity in a systematised way is the scope of the present research. Through an experimental methodology focused on project development, three case studies are presented—*Netskola*, *Kowork* and *More South*—all of which took place in socially and culturally disenfranchised neighbourhoods of the wider Lisbon area, specifically in the cities of Amadora and Oeiras. Then follows a case study evaluation conducted using the Delphi method. The research concluded that participatory art and design is a holistic territory that can be understood as interdisciplinary or transdisciplinary and that this understanding can foster the development of alternative and innovative solutions that contribute to the sociocultural sustainability of vulnerable urban areas. Recognising the advantage of this expanded field and enhancing the socially engaged art domains is not only important for these areas of knowledge, which can thus develop further, but also for the many situations in society that can benefit from systematic creativity.

Keywords: Participation, Co-design, Social innovation, Societal image, Transmedia practice

Common ground

The research starting point is based on the recognition of weak common ground between the various practices of social art and the fact that this shared knowledge is the result of an interdisciplinary or transdisciplinary dialectic that could be further developed for the benefit of art, design and society in general. There is also the perception that the development of socially useful hybrid art initiatives is a means of intervention in society, with great potential for the development of social and cultural sustainability.

The finding of common social objectives and the use of similar methodologies and methods by different art practices is a phenomenon that touches upon all fields of the arts and has an ethical and political aspect in confronting social concerns. As far as research is concerned, visual arts and design practices take on particular importance. In certain cases, in addition to promoting reflection, representation or the presentation of some answers to a set of problems in society, these practices seek to intervene directly with concrete solutions.

Contemporary social art practices that are developed within certain communities have as their main goal the emancipation of the people involved so that they feel stimulated by the experience in which they participate (Helguera, 2011). In Bishop's (2012) view, this is an expanded field of post-studio practices that have taken over several designations, such as socially engaged art, community-based art, dialogic art, participatory art, collaborative art, activist art and new genre public art, amongst others.

On the other hand, through the creation of services, systems and digital products, design is increasingly interactive and participatory, as well as characterised by a dynamic and co-creative aesthetic, increasingly based on knowledge networks and participants' qualifications, then restricted to commercial products. These features sometimes result in more ephemeral or immaterial design approaches. Within this logic, many artists no longer make a clear distinction between their practice and a user-centred design approach, which is dramatically more political and speculative (Holt, 2015). Similarly, certain designers are experimenting with methodologies informed by participatory and dialogical aesthetics (Kester, as cited in Holt, 2015).

These are ambivalent art forms, which on the one hand give continuity to their disciplinary language, and on the other hand play a role in social intervention. When focusing on social issues, both disciplinary fields tend to be characterised by a higher degree of interdisciplinarity and transdisciplinarity. The question is the extent to which there is a mutual exchange of concepts, methods and methodologies in a complementary process, or even the existence of a disciplinarily more autonomous approach, but which goes beyond conventional limits whenever experimentation in other fields is necessary. Parallel to this question, it is important to mention the problem of the means of expression in the development of participatory art and design practices. This overcoming of borders is a sensitive concept because it contributes to the transformation of each discipline, thus surpassing the conventional approaches of each territory.

This takes into account that in visual arts one of the most used expressions is participatory art—as well as in design the denomination of participatory design—which is increasingly recurrent. Regarding the three case studies discussed further, the designation used to define the developed practice is participatory art and design. Regarding the artists and/or designers involved in the process, they are seen as conductors of a participatory project who seek to keep participants during the outlined activities so that they autonomously go ahead exploring knowledge. This is a way of promoting equality in which artists and designers in participatory projects have a role as conductors. According to Rancière (2002), this is a necessary quality for social sustainability, which needs agents for its promotion and permanent confirmation.

The social axis of the arts

Historically, the notion of holistic territory is a phenomenon that has its roots in the Western classic period, since the use of the *teknè* concept, in which there were present the notions of art and technique that served as the basis for the varied evolutions of art disciplines. At the end of the twentieth century, Galeyev (1991) created an open system to include art practices based on new techniques and technologies. The objective was to demonstrate the unity and systematisation of the existing art forms and to understand how they position themselves within an artistic culture. From this conceptual framework, an approach is made to the system of differentiation between the different arts to further propose the existence of a social axis with two distinct poles, namely the pole of social arts and the pole of self-centred arts (Figure 1).

This is a way of classifying all the existing art forms, which, regardless of whether they are framed by a particular art discipline, such as painting, sculpture, design, architecture, music, theatre, amongst others, have a greater or lesser degree of social action. According to this understanding, zero degrees of social meaning indicate art forms exclusively focused on questions of expression and technique, from which, according to the position in the referred axis, they may reveal greater social focus.

One of the precursors of social art forms that most influenced the territory in question is the artist Suzanne Lacy through the concept of a new genre of *public art* that she developed to characterise and deepen the

socially engaged art field. According to Lacy (1995), the artist imbued with an ethical sense articulates his/her thought and intentions with the ideas manifested by the social body in the public domain. In this sense, Lacy analyses different behaviours that an artist can have according to a scale between the public and private, such as the artist as the experimenter, as a reporter, as an analyst and as an activist. Parallel to this, Lacy develops the issue of public participation in the work of art, which is understood according to different degrees of responsibility, collaboration, proximity and involvement with the work of art.

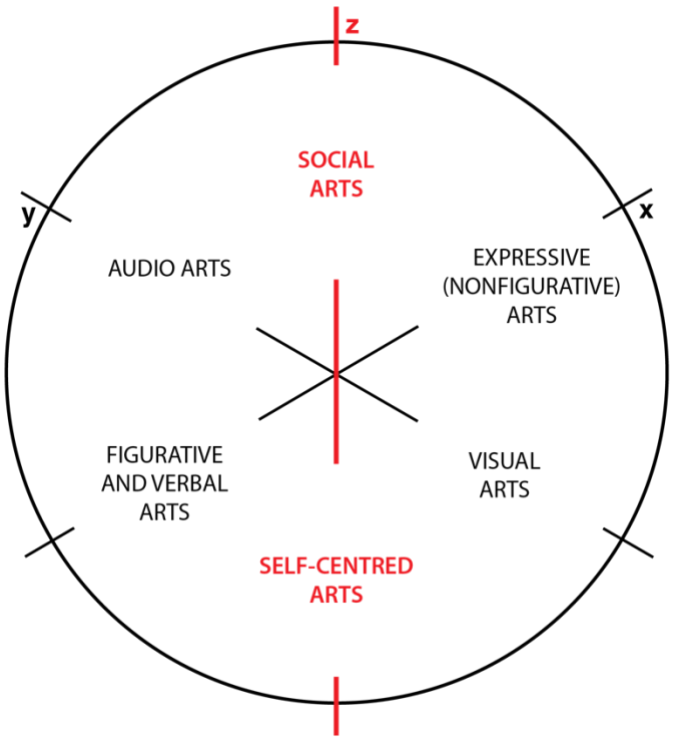

Figure 1: Social axis Z with two poles: The pole of social arts and the pole of self-centred arts.

This particular notion of activism is also followed in the sphere of design. Authors such as Fuad-Luke (2009) and DiSalvo (2012), amongst others, explore a notion of design based on civic reflection and political action with the influence of several areas of knowledge, as well as involving protagonists with different characteristics, such as designers and other professional or non-professional creative agents. This line of thought is a consequence of the criticism that was first offered by Papanek (1971) to the design discipline, which he considered to be linked to the consumerist culture that has propelled design culture since the first Industrial Revolution.

Within the scope of art and design practices that developed a culture based not just on techniques, technologies and aesthetics, but also underpinned by ethics, other authors were alerted to a set of social and environmental problems since the 1960s. A common feature is a relational and dialogical issue, which is transversal to all forms of social art and design. In the sphere of visual arts, the concept of participation and collaboration led artists to a different understanding of the logic of authorship centred on the artist or on a collective of artists to assume they are authors of events shared with other participants who, with different degrees of commitment, may also be considered as creative agents. In the scope of design, this relationship between various creative sources and protagonists is a situation of *diffuse design* and *expert design*, which is fundamental cooperation for the future development of society. A coalition not only focuses on the resolution of concrete problems but also the construction of social values and qualities (Manzini, 2015).

According to Manzini (2019), despite the neoliberal logic in various spheres of society, as well as in human thinking and behaviour, transformative social innovation processes occur in the opposite direction. These modes of action result from creative initiatives from citizens, which are characterised by being both individual and social, driving the creation or rehabilitation of links between people, as well as between people and the places they live in and, consequently, promoting the development of new communities. In this sense, participatory art and design is a significant way to systematise social and cultural innovation and strengthen democracy. Social innovation through creative practices and dialogic collaboration, in general, are ways of imagining and experimenting with social alternatives towards sustainability, where local initiatives are particularly meaningful, whose repercussions can generate other forms of development at a global level (Escobar, 2018).

Emancipation through participation

In the field of participatory design, a significant aspect is the array of different possibilities, specifically in terms of innovation, collaboration, emancipation and motivation, as well as concerning forms of public or community participation. These determine how the relationship between designer and user occur (Lee, 2006). According to Manzini (2015), there is now a relatively strong consensus around the idea that design is an activity shared by different players whose initiatives are based on the same principles of creativity and reinvention of forms of interaction with the environment. Some designers with scientific knowledge who are more sensitive to this problem have been looking for ways to relate with empirical designers and to collaboratively participate in the creation of products and services that better contribute to society. There are also increasingly design initiatives for social innovation that arise spontaneously and are promoted without the participation of design specialists, by citizens who act in isolation or organised groups, as well as by professionals from other art fields and related areas.

In tandem with creating coalitions between people with different forms of knowledge or finding solutions exclusively for human problems, it is important to mention the need for conductors of participatory art and design projects to establish other collaborations with non-human agents. Considering that there is active and continuous participation with more-than-human worlds (Escobar 2018), Holt (2015) argues that the environment should be considered a user and not just something to be explored as a theme or an aesthetic form. In Escobar's (2018) view, this is an understanding based on the effort to reconnect the domains of culture and nature, namely human and non-human agents, through theoretical and practical proposals, such as "visualising networks, assemblages, nature cultures, or socio-natures, or through and analysing the composition of the more-than-human worlds always in the process of being created by all kinds of actors and processes".

The critical issue for understanding participatory art and design lies in the way the respective conductors interact with people and the environment, in the relationship that is established between each art and design area with society in general, as well as the integration of new experiences and concepts within the scope of participation. Therefore, it is important to expand the field of participatory art and design to other fields of artistic collaboration and to benefit from the resultant synergies. In the scope of design, Lee (2006) argues that the way the designer-user relationship occurs is decisive for the different participatory design manifestations, such as in the cases of innovation, collaboration and emancipation. In the sphere of innovation and collaboration, the interaction is centred around the user. Regarding motivation, the difference lies in the fact that design methods are influenced by people's initiative. In the case of emancipation, the main issue lies in the fact that both the designer and the user play an active role

in a collaborative design process aimed at finding and implementing better solutions for the valorisation of a given social context.

Participatory art and design through emancipation, which was the methodology used in the case studies analysed hereafter, is a more user-focused model often sought by users. The relationship between the conductor and the user in this domain occurs horizontally in a creative equitable group, with the common goal of promoting its development. It is a way of encouraging and supporting people through co-creativity, and this usually occurs in small initiatives where the outreach and follow-up work between the conductor and the user is constant. It is from the opinions and experiences of each partner that the whole process is built. An important aspect of this concept is the fact of disseminating the transfer of design knowledge that can be freely used by the user (Lee, 2006).

According to Fuad-Luke (2009), the co-design methodology is another significant designation that brings together several practices of contemporary design that are determinants for the development of social innovation. The dynamic of knowledge based on co-design processes is open to the participation of different users, even if the contribution made by the empirical designers is not always helpful. The dialogical relation in which listening is as important as speaking is decisive for the development of participatory art and design. In this context, parallel to critical capacity and creativity, the artist-designer expert must develop his/her relational capacity to interact and enhance the co-design process. The dialogical method should not be used as an instrument to control the co-design process but to stimulate its development and keep it open.

Mechanism of co-design and societal image

Also important for the understanding of this common field of participatory art and design and the notion of transdisciplinarity among both territories is the idea of a transmedia practice, which is a concept created by the Fluxus artist Shiomi Mieko. The importance of transdisciplinary logic for understanding this hybrid art domain is related to the fact that it allows a better comprehension of the existing knowledge between disciplines whose boundaries are in constant dynamism as well as concerning spaces between them. This interstitial space is considered to be of greater relevance for the development of each disciplinary field (Nicolescu, 2010). The transmedia concept that was introduced by Mieko (2013) is a way of demonstrating the nature of her conceptual art projects, which were initially conceived for one specific medium and later assumed other interpretations and art forms by the artist and other Fluxus members. According to Mieko (2013, pp. 1–2), "… just as people continue their journeys by transferring from one type of transportation to another, an artwork can continue its creative evolution by transferring from one medium to the next".

Like Mieko's practice, the participatory art and design projects developed in disenfranchised neighbourhoods of Amadora begin by using design as a medium, namely through participation and co-design, to later become signifying objects through the reproduction of the communities involved in creative activities (Gorgel Pinto, 2017). The representation of communities is what constitutes the *Emancipation and Creativity Atlas*, which is an archive of photographs and videos produced during each of the projects, namely *Netskola*, *Kowork* and *More South*. Art and design practice is informed by aesthetic and civic questions whose purpose is the development of citizenship and sociocultural sustainability with the disenfranchised target populations. This atlas of images is the last stage of the systematisation of processes involving partners and participants in a continuum. The images and videos cannot be restricted to their form and appearance or as the outcome of only one author. They are also part of the participatory process whose main objective is to question and explore the common space between participatory art and design

and simultaneously demonstrate the potential of the arts for the development of social and cultural sustainability (Gorgel Pinto, 2019).

The whole process of *participatory art and design—the societal image* that was experimented with through the research case studies—is defined by specific objectives and by the systematisation of processes. Within the methodology of the three projects, it is important to note the idea of a mechanism for the coordination of all actors and constraints, as well as for system operation and the consequent production of specific contents. This mechanism is titled a *co-design machine* and has as a starting point the identification of a set of factors, such as the training needs required in the context, the participants' willingness to learn, the material conditions and the experience of the local participants with which the interactions occurred for the development of the project, as well as the perceived latent potentialities. The *co-design machine*, inspired by Meadows and Wright's (2009) systems thinking, is a mechanism to boost, reinforce and generate the growth of existing creativity in individuals and the community, and in turn contributes to the regulation of creativity capital (Figure 2). This means that it is a way of promoting the resilience and sustainable development of certain social groups as regards the ability to find different and original solutions to situations of inequality and social vulnerability.

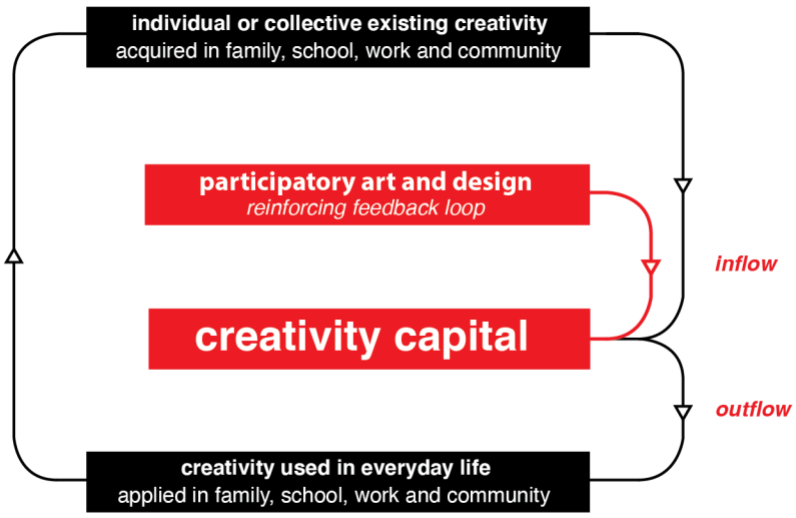

Figure 2: Co-design machine systematisation: A process to boost creativity in the individual and the community.

The *co-design machine's* main goal is to create a small-scale dynamic that seeks to influence the sociocultural structure of the larger-scale system, which is characterised by slow and stabilising development. It is a socio-technical system (Manzini, 2019) focused on developing solutions to real problems, as well as fostering the common good. In Wahl's (2016) understanding, this type of smaller system has the advantage of being faster and thus affecting larger systems with more efficiency, either through a chain reaction or through a "transformative (r)evolutionary" development. In this sense, the *co-design machine*, operating in the local sphere through a practice of participatory art and design with citizens in vulnerable situations, aims foremost at emancipating them, as well as rehabilitating the sociocultural fabric creativity in a broader sense.

Case studies in disenfranchised neighbourhoods

The three participatory art and design projects developed and reproduced in the *Emancipation and Creativity Atlas* are entitled *Netskola* (Image 1), *Kowork* (Image 2) and *More South* (Image 3). These case studies took place in the Amadora and Oeiras municipalities.

Amongst the most significant phases that are present in all projects are the interaction with local associations with roots in the territories, the existence of facilities and equipment that these organisations have and made available for carrying out each workshop, the voluntary collaboration of residents participating in the activities, the fact that these occurred in places where people live, the choice of themes and educational activities, as well as the definition of purposes related to the people's interests and willingness to participate in learning and creative processes, and the dissemination through an archive of video and photography.

Image 1: Netskola project: ICT workshop with adults.

The *Netskola* (2013–2015) project was the first intervention to take place. This initiative was developed in disenfranchised neighbourhoods of the city of Amadora in partnership with local private social solidarity institutions. In this case, an educational service was created in the field of computer literacy and photography, and it was open to participation by locals, mostly African or Afro-descendant. The activities took place in two local associations that people often use for social and educational support.

The *Kowork* (2015–2017) project resulted from a collaboration platform between the Faculty of Architecture of the University of Lisbon and the local association Moinho da Juventude (Youth Mill in Portuguese) in the Cova da Moura neighbourhood, Amadora. The main objective was the creation of a training course focused on the development of skills in design to promote the institution's carpentry. In the context of creative stimulation and critical thinking, the participants of African descent were led

to survey latent problems in the neighbourhood and to propose possible solutions. In this sense, pieces of urban furniture were produced and installed in various areas of the neighbourhood, such as garden benches and litter bins built with reused wooden pallets.

The *More South* (2017–2018) project was based on a proposal made by the Aga Khan Foundation in Portugal. A collaboration was initiated to implement a socially engaged art project with a group of African immigrants living in different neighbourhoods in a creative and participatory project in which design outcomes were developed. Based on the participants' knowledge, the production of cloth bags with capulana (printed fabric used in some African countries) applications was carried out. Visual poems, also created in a participatory manner, appeared on bags. The idea was to develop a survey of expressions from various African languages and Creoles informed by the knowledge of those involved and further elaborated through graphic compositions.

A common characteristic of the three case studies is the fact that they initially worked through the organisation of workshops and other educational activities and then unfolded into significant objects through the reproduction of the initiatives. This kind of societal image constitutes a photographic testimony through which the spectator metaphorically participates in the project. The observation of these societal reproductions requires a critical perspective of the sociocultural context in question, shaping a political attitude towards public life (Azoulay, 2015). Through the *Emancipation and Creativity Atlas,* the viewer becomes a witness of the evidence produced as well as the subject of a reflection around the permanent need for support and requalification of communities living in disenfranchised neighbourhoods (Gorgel Pinto, 2019).

Image 2: Kowork project: Design workshop.

A negative aspect was the participants' precarious condition, which generally makes it impossible for them to be more involved in the initiatives. This is something that can be minimised through alternative forms of interaction and by valuing empirical knowledge that can contribute to a greater commitment of the participants and reduce existing inertia. On the other hand, it is possible to promote group cohesion through an involvement adapted to each situation and through the accountability of participants to certain tasks. Another concern was the possible lack of interest from the community in the participatory actions, and these can be minimised through the creation of collaborative educational contexts of their interest and by the perseverance of some participants in the project who are more autonomous and proactive. Amongst the qualities that can strengthen the experimented participatory art and design practice, what stands out are a) the valorisation of the aesthetic dimension of ethics, b) the use of a transdisciplinary methodology based on several means of expression for the benefit of social objectives to be achieved and c) the level of the relationship between art and social innovation.

Image 3: More South project: Engraving and sewing workshop.

The possibility of the adoption of the projects by the communities or by partner institutions is another advantage that can be leveraged, given the evident improvement that these actions bring to the communities in question. Through the experimented systematisation of the processes, it was proven to the partners that this kind of collaborative work is a benefit that can be continued and deepened. Also, it was demonstrated to the participants that with their will and creativity and these kinds of collaborations, it is possible to aspire to more sustainable sociocultural conditions.

Establishing consensus through the Delphi method

The application of the Delphi method focused on a set of questions with relevance for the study. The reflection on the issues and topics considered was crucial and resulted from the analysis and exploration of information collected through a questionnaire to reach a consensus. Another decisive aspect for

common understanding is the fact that there was an eclectic group of experts whose territory of origin corresponds to the various areas that inform the research. Designers, artists, theorists in both areas and other experts with experience in public affairs were part of the panel that allowed the application of the Delphi method.

The Delphi method was used because it is an effective way of organising a group communication process, which enabled interaction with a panel of specialists to function in the critical analysis of a complex and subjective problem (Graham et al., 2003). In this context, judgements, opinions and convictions were systematically collected and structured, giving priority to the consensus creation, but also considering divergent points of view. Among the invited personalities to participate were design theorists such as Alastair Fuad-Luke and Maria Hellström Reimer; artists with a practice marked by the involvement with communities and by participatory art forms, such as Jane Gilmor, Virginia Fróis and the Wochenklausur collective; designers with an activity focused on participatory design and co-design, such as the collective Fermenta; a professional photographer and designer, David Van Allen; and professionals in public functions, such as Ricardo Robles and Ana Isabel Ribeiro from the Lisbon municipality, as well as Mário Campos from the Almada municipality.

The panel was asked a series of questions, and they answered on the main aspects that inform the developed participatory art and design practice. The members of the panel also analysed and justified the resultant different perspectives. The main objective was to test the concepts and the experimented practice from a multitude of disciplinary perspectives. The inquiry process consisted of two multiple-choice questionnaires with several relevant questions for the research. In the first questionnaire, only five questions did not receive the intended result. Subsequently, based on the five questions that did not obtain consensus, plus the set of answers that did not reach strong agreement, the study continued with the application of a second questionnaire. This last approach to the expert panel resulted in a consensus on all issues.

Amongst the expressed thoughts, the appreciation of cultural capital through an emphasis on art, heritage and plurality stands out, as well as the fact that the creative input of specific communities and citizens, in general, should be recognised and supported by professional artists and designers. Thus, more and better conditions for artists and designers to develop initiatives to encourage creativity and social innovation are necessary to improve creativity amongst citizens living in vulnerable areas.

Regarding the methods and methodologies of participatory art and design, the panel highlighted the understanding of common aspects that are informed by both politics and aesthetics. Depending on circumstances, this area of knowledge should be seen as a whole and as an interdisciplinary or transdisciplinary phenomenon.

Considering the different targets and forms of expression produced during each project (participants, community, society, art and design specialists), another consensual view was the understanding of different possibilities of interpretation derived from the participatory interventions. The proliferation of participatory art and design initiatives of an activist nature is a relevant way to boost sociocultural transformation, especially the promotion of citizenship issues in a sphere of sustainability, while reacting critically against the political agendas of certain organisations with social responsibility. This kind of practice is thus an artistic phenomenon, informed by ethics, aesthetics and politics and aiming at the involvement and collaboration with citizens for the experimentation and implementation of alternative sustainability models.

Concerning the dialogue between artists and designers with participants to stimulate interaction and optimise the collaboration process, the panel agreed that this is a core value in the social innovation process for the emancipation of citizens living in disenfranchised neighbourhoods. In this context, the use of participatory creation methodologies, particularly co-design, is a relevant medium for systematising methods of participatory art and design.

Finally, the expert panel acknowledged that the representation of citizens residing in disenfranchised areas through images of their engagement in creative initiatives for social innovation is a proactive form of representation that goes against the usual reproduction of stigmas. These and other consensual opinions can be better analysed in the questionnaires (Appendix 1).

Conclusions

The results obtained in the present research can be verified in several ways. On the one hand, through what was achieved with each social group, and on the other, through the generated intersubjectivity between the areas of knowledge in the fields of design, visual arts, culture, education and social action. Regarding the developed initiatives in the disenfranchised neighbourhoods, the outcomes were not only recognised by the participants, but it was also possible to confirm through their interest and constant presence in the development of activities that these types of actions are significant and contribute to the residential areas that engaged. The projects' implications in society are also revealed by the fact that they lead participants to the production of contents and objects with public interest and utility. Also, the outcomes are a testimony of creativity and civic participation in community life. In the *Netskola* case, these aspects were less evident because the project participants produced only small, illustrated texts about cultural references with which they identify themselves. However, both in *Kowork* and *More South*, through the creation of urban furniture and fabric bags with stamped visual poetry, value and impact were more evident for the local community, society in general and the activists of the established platforms.

Regarding the intersubjectivity generated in the territories of art and design, as well as in the areas of culture, education and social action, this was measured not only through the involvement with each of these contexts but also through their overlap. Within the scope of the design discipline, the understanding of the participatory and transmedia practices in question and the theoretical implicit issues were predominant since the study started from the design discipline. This research characteristic is a relevant aspect that demonstrates the openness of design and the ability to expand to other forms of knowledge.

In the areas of culture, education and social action, the generated knowledge resulted from involvement with different organisations within the scope of the completed projects. These associations of social solidarity and non-governmental organisations, with which the intervention platforms have been created, have in general professionals with qualifications in areas such as psychology, sociology, economics and social assistance with whom the knowledge exchange was enriching. It should also be noted that these types of institutions are promoters of educational and cultural activities with experience in using public funding, as well as experience dealing with different local entities. In this context, in the development of the projects, through collaboration with local organisations and established contacts with the heads of public entities in these territories, it was possible to demonstrate the relevance and usefulness of this type of participatory art and design project, as well as discuss and disseminate among those experts some of the main concepts and the modus operandi.

Among the objectives achieved, it is important to highlight the production of a photography and video archive that represents the developed practice. Regardless of the citizenship status of all the case studies, the existence of another form of citizenship emerges, made possible through the imagery in question. This is an archive with images showing a disenfranchised community that lacks social support to unveil the presence of a rich culture. However, what is worth noting is that despite the many adversities in these marginalised places of our society, there are creative citizens full of knowledge and ready to pursue life opportunities (Gorgel Pinto, 2019).

For further research in the same field, the lessons include fostering pluralism, eclecticism and a transdisciplinary approach. Considering that this type of socially engaged art initiative is characterised by multiplicity, the coexistence of different aspects and is constituted by elements from several origins, it is pertinent that different artistic approaches of social character seek other possibilities of intervention with similar objectives and without the loss of identity. If the initiative comes from the visual arts or design, for example, and within these with different means of expression and specificities, it is constructive to maintain an attitude that assumes itself by its characteristics and disciplinary context, at the same time that it is informed by other methods and methodologies, whether for their use or simply to better reflect on their condition.

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Appendix
Selection of questions from the first and second questionnaires:

Given the existence of several participatory art practices with social groups and communities, namely in the sphere of visual arts and design, how relevant is the fact that these disciplines inform each other concerning the methodologies, methods and means of expression? [75% *Very relevant*]

How do you consider social art and social design as disciplinary practices? [75% *Depending on the project circumstances, an interdisciplinary or transdisciplinary phenomenon*]

How important do you consider the proliferation of social art and design initiatives of an activist nature, whose objective is to boost sociocultural transformation, especially the promotion of citizenship issues and their respective interests and ambitions in a sphere of sustainability, while reacting critically against the political agendas of certain organisations with social responsibility? [75% *Important*]

In parallel with the critical and creative sense, how relevant is dialogue between artists and designers with participants to stimulate interaction and improve the collaboration process? [90% *Very relevant*]

How important is the use of art and design for social innovation focused on the emancipation of participant citizens? [80% *Very important*]

How important do you consider the use of participatory creation methodologies, namely co-design, by other disciplines in the field of social art? [88% *Relevant*]

Do you agree that the representation of groups of citizens living in disenfranchised areas through images of their engagement in creative initiatives for social innovation is a proactive form of representation which goes against the usual reproduction of stigmas? [80% *Agree*]

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Co-creation in circular cities: A design perspective

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Abstract

The release of the European Green Deal for the circular economy has made more and more municipal authorities embed circular economy principles into their visions and strategies, fostering the transitions towards a "circular city". Collaborative practices are becoming familiar, and concepts such as co-creation are entering the policymaking vocabulary, indicating that citizens and other actors are being asked to work collaboratively towards a sustainable future. This also means re-designing systems and services in cities with the aim of tackling emerging social and environmental issues and co-creating innovation paths. However, co-creation as an approach for implementing a circular economy at the city level has not yet been thoroughly investigated. The aim of this paper is to outline a framework that can be used by cities to identify new opportunities for co-creation initiatives from a design perspective. Using a three-step research process: (i) literature review, (ii) case study analysis and (iii) results interpretation, this paper delineates nine co-creation categories for sustainable development and identifies stakeholders and tools to be adopted by seeing circular economy principles as the ultimate goal.

Keywords: Circular economy, Circular city, Co-creation framework

Introduction

After the release of the European Green Deal for the circular economy, more and more municipal authorities are embedding circular economy principles into their visions and strategies, fostering transitions towards a "circular city". The circular economy concept —popularised by the Ellen MacArthur Foundation (EMF) – is not limited to businesses but entails a wide transformation that affects all the systems in which we live and act. In this scenario, cities can play a crucial role in fostering sustainability at all levels, from policies to a single person's behaviours. Many cities, especially in Europe, are embedding circular economy principles in their visions and strategies with promotion by the EU. Increasingly, the concept of a circular city is becoming familiar. The transition from a linear to a circular connection requires various stakeholders' participation, discussion and action. The municipal authority is no longer the only body that takes the lead and needs to work with other parties to realise a sustainable urban future. Although the concepts of co-creation and co-production are well explored in the literature, particularly in the field of management and service science, co-creation at the city level has not yet been thoroughly investigated.

By examining how co-creation activities operate in the current circular city from a design perspective, this paper aims to explore the opportunity of collaborative practices in circular cities. Hinging upon qualitative analysis, this research proceeds as follows: (i) literature review, (ii) case study analysis, (iii) results interpretation in a co-creation framework. First, the literature review examines the definition of a circular city and explores the concepts and forms of co-creation. Second, by examining six European urban contexts, forms of co-creation activities in frontrunner circular cities are analysed, and remarkable co-creation activities are highlighted. In particular, the research builds upon the "co-creation design framework" proposed by Frow, Payne and Storbacka (2011) and the ReSOLVE framework (EMF, 2015). The result is an integrative co-creation design framework, proposing nine co-creation initiatives that

summarise state-of-the-art circular city operations, including the stakeholders involved and the tools adopted. The research outcomes underline the importance of embedding co-creation practices in a circular city to support strategies, plans and concrete outcomes. Also, the research reveals the lack of a widely shared approach in such a transformation process to attain a circular city.

Overview of the circular economy in cities

The concept of the circular economy is introduced by EMF (2015): "restorative and regenerative by design and aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles" (p. 19). The notion and principles of the circular economy have been around for a long time. It can be seen as an umbrella concept encompassing various principles (i.e. industrial ecology, biomimicry and cradle to cradle). The circular economy relies on three fundamental principles (EMF, 2015): (1) preserve and enhance natural capital; (2) optimise resource yields; and (3) foster system effectiveness. In addition, the circular economy contributes to the delivery of at least 12 Sustainable Development Goals (SDGs) (United Nations, 2015) at both the local and global levels. In particular, a circular city relates to Goals 11, 12 and 13, which are about making cities safe, resilient and sustainable, as well as taking urgent action to combat climate change and its impacts. For example, Helsinki is the first city in the European context to integrate its circular economy strategy into SDGs, representing their ambition to achieve a permanent positive change (City of Helsinki, 2019).

However, although the definition of a circular city is weak, the objective of the circular economy strategy is clear. "A circular city aims to generate prosperity and economic resilience for itself and its citizens while decoupling value creation from the consumption of finite resources" (EMF, 2017, p. 7). A circular city embeds the circular economy's principles across all its functions, establishing an urban system that is "regenerative and restorative by design" (EMF, 2015). Prendeville, Cherim and Bocken (2018) interpret a circular city as an element in the larger goal of developing a future-proof city that practises circular economy principles to close resource loops in partnership with the city's stakeholders. Girard and Nocca (2019) see a circular city as a metaphor for an ideal space where ecological crises and social inequalities are eliminated. The circular economy provides cities with an excellent opportunity to face tough challenges, as specified by activities that may occur at various scales. Considering this, the circular economy should be adopted into policy development and implementation at different scales (EMF, 2015; EU, 2020; OECD, 2020). The ReSOLVE framework (EMF, 2015) turns three key circular economy principles into six practical actions to generate circular strategies and initiatives. However, the ReSOLVE framework is outlined from a business perspective and is not entirely suitable when applied to the urban context. The circular city framework (CCF), which is based on the ReSOLVE framework delivered by Prendeville, Cherim and Bocken (2018), combined with bottom-up and top-down interventions (Krauz, 2016; Ghisellini et al., 2016; Lieder & Rashid, 2016), expands the ways in which the circular economy could be put into practice in an urban environment.

Inside a circular city, hybrid spaces (Panzar & Willig, 1981) are needed that connect diversity and create a bridge between different actors as they occur within the arena of public-interest services (Selloni, 2017). Usually, such hybrid spaces are enabling platforms (Jegou & Manzini, 2008), namely, virtual or physical spaces where inspiration, exploration and discussion arise. Involving a group of citizens and other actors in collaborative processes is crucial to facilitating decision-making and developing solutions. Apart from digital platforms, part virtual and part physical spaces provide social and spatial areas for learning and experimenting, which are seen as being convergent with the circular economy (Ede, 2016). Enabling platforms like Urban Living Labs and Fab Labs allow stakeholders to team up and build up a strong network that is tightly connected to the city administration. A prominent example is the industrial area in

Amsterdam, Buiksloterham, where the whole district runs as a large-scale living lab, aiming at achieving total self-sufficiency and circularity (Steen & van Bueren, 2017).

A few challenges have arisen in previous research regarding the implementation of the circular economy in cities. One of the barriers claimed by Prendeville, Cherim and Bocken (2018) is that there is an unbalanced way to involve stakeholders. Authorities place too much emphasis on leading businesses to guide the civic society. Conversely, the term "smart" frequently appears in circular cities' literature about the use of new technologies such as sensors or digital platforms (Girard & Nocca, 2019). Although digitalisation is crucial for the urban transformation of the great metropolis (i.e. economic restoration and social cohesion), the benefit is maximised only when the social context is considered. Even though the implementation of the circular economy in cities is proliferating, research shows that many municipalities identify themselves as a circular city without comprehensive knowledge about it (Prendeville et al., 2018).

Consequently, there is a need to accelerate the transition towards a sustainable urban future with a clear framework. Progress towards the future-proof city needs greater participation for sharing the responsibility. Human-centred approaches are crucial for such cultural shifts across various government and stakeholder levels. The design's nature provides positive directionality about the future and proactively contributes to what will come about next (Fuad-Luke, 2012). From design's contribution, it is important that best practices, processes and tools can be developed and spread in various contexts. In this scenario, services and systems need to be transformed to meet the main current challenges, and practical methods are required to co-create with different stakeholders.

Designing co-initiatives in circular cities

Recently, municipalities have adopted new strategies to involve people in policymaking and public services for people-centred solutions (OECD, 2019). There is an increasing need to develop collaborative knowledge that supports a whole-of-system view and transformational change at multiple scales. This reveals an emerging focus on co-creation in actor networks (Åkesson et al., 2016; Pinho et al., 2014), where the municipality has a leading role, consisting of coordinating researchers, practitioners, citizens, designers and other stakeholders in the co-creation process. Although interest in collaborative practices is gaining momentum, the specific means of co-creation in circular cities remain underexplored.

The academic discussion of co-creation is extensive. In design research, Sanders and Stappers (2008) define co-creation as "any act of collective creativity, i.e. creativity that is shared by two or more people" (p. 6). When applied to varied contexts, the concept of co-creation can underline the systematic principle for business and customers (Prahalad & Ramaswamy, 2004; Grönroos, 2012), the partnerships between public service and citizens (Voorberg, Bekkers, & Tummers, 2015), or the shared responsibility (Lelieveldt, 2019). Frow, Payne and Storbacka (2011) argue that the advantage of subdividing co-creation into precise forms is centring innovative co-creation opportunities. With this aim, they put forward 12 forms to improve firms' capabilities for co-creation. In addition, in their later research, *Managing Co-creation Design: A Strategic Approach to Innovation,* Frow, Nenonen, Payne and Storbacka (2015) propose a framework to help firms identify new co-creation possibilities. On the other hand, Oertzen et al. (2018) developed an integrative framework, and a detailed process was formulated to describe the specific forms of co-creating services, containing the five "co-" phases. Moreover, from the viewpoints of Ramaswamy and Ozcan (2018), "co-creation is the enactment of interactional creation across interactive system-environments (afforded by interactive platforms), entailing agency engagements and structuring organisations" (p. 5). The "interactional co-creation framework" developed by Ramaswamy and Ozcan (2018) stimulates thinking on both the means and the ends of interactive value creation in a broader way. Interactive platforms are

means where the potential value of participation will be generated in value co-creation, ranging from the perspective of the ends of experienced actors to empower actor networks with resourced capabilities. Above all, we witness the growing dynamics of co-creation accompanied in an increasingly interactive way.

In the private sector, co-creation influences customer satisfaction and loyalty and helps firms achieve a competitive advantage (Grissemann & Stokburger-Sauer, 2012). In this scenario, users are seen as an interesting source of product and service innovation (Prahalad & Ramaswamy, 2000; Vargo and Lusch, 2004). However, when discussing public services, these end users are citizens, namely a more comprehensive community with a wide variety of needs and characteristics. As one of the crucial actors, citizens become increasingly crucial in the public decision-making process (Voorberg, Bekkers & Tummers, 2015). More and more policymakers and decision makers are trying to adopt strategies to involve them as active players for growth and prosperity. Voorberg, Bekkers and Tummers (2015) identify three degrees of citizens' involvement in the co-creation process (which will be discussed in the upcoming section): (a) citizens as co-implementers (involvement in services, which refers to the transfer of implementing activities previously carried out by the government); (b) citizens as co-designers (involvement regarding the content and process of service delivery); and (c) citizens as initiators (citizens who take up the initiative to formulate specific services). They point out that since both efficiency and satisfaction are raised during the process, the goal of co-creation is the value produced in itself. Therefore, policymakers must enhance stakeholders' trust and acceptance. Even though the municipality, businesses and civil society have varying objectives in moving towards the circular economy, it is essential to encompass various levels of stakeholders, build synergies at the correct scale and minimise the future burden for society. For example, the Netherlands regards citizens as a major stakeholder in its revised circular economy roadmap due to the considerable contribution that they make in relation to sustainable consumption habits and behaviours (OECD, 2020).

Hence, design activities embody co-creation that are "typically carried out in groups, with roles involved in complex relationships" (Nelson & Stolterman, 2012, p. 290) for strengthening creativity, developing innovative solutions, and generating value. While there is a significant difference considering the extent of involvement and actors' role, value is created collaboratively with people (Akoglu, 2015). The adoption of co-creation activities in circular cities can bring different benefits, such as enhancing the awareness of environmental issues and encouraging new habits among a variety of stakeholders (Bačová et al., 2016; Jonker et al., 2018; Paiho et al., 2020). Based on these premises, this paper aims to explore the various forms of co-creation that can be adopted to foster circularity at the city level.

Research process and the first results

Previous research has already recognised the advantages that co-creation can bring about (Barczak, 2012; Frow et al., 2011, 2015). However, to better understand how co-creation is adopted in circular cities from a design perspective, a three-step research process has been undertaken: (i) a literature review, (ii) a case study analysis and (iii) results interpretation within the co-creation framework. First, a systematic literature review was carried out to explore the role of design in supporting the transition to a circular economy at the urban level and the increasingly active and interactive role that co-creation plays in the public sector. The objective is to understand the most noticeable co-creation forms inside circular cities and the practices used to support the transition towards circularity. Second, we carried out a case study analysis. The aim was to identify co-creation practices in circular cities and understand the explicit or potential contribution of the design in the processes of co-creation to have a wider view towards circular cities implementations. Focusing on the European context, the criteria for determining cities to be examined were: (a) defining themselves explicitly as a circular city; (b) implementing a systematised circular city strategy (circular

programmes/agendas at city/regional level instead of a single project); (c) engagement, involvement or participation are emphasised in a co-creation process with citizens; and (d) availability of information. According to the OECD (2020), four distinct levels of advancement towards the circular economy transition of cities are labelled, which are advanced, in progress, newcomers and not in place. Advanced means cities and regions establishing clear strategies or roadmaps and engaging diverse stakeholders. In progress are those cities and regions that have already applied for specific programmes and/or are starting their implementation towards the circular economy, following impromptu activities. In the cluster of newcomers, cities or regions explore options for implementation by recognising the circular economy's relevance and potential. The cluster of not in place was excluded in this research because of insufficient data and restricted documents.

To increase diversity within these three categories, we selected two cities for each group. Eventually, six cases were selected, including (alphabetical order) (1) Amsterdam (advanced), (2) Brussels (advanced), (3) Glasgow (in progress), (4) Gothenburg (newcomers), (5) Helsinki (newcomers) and (6) Ljubljana (in progress). The municipalities mentioned stress the collaborative manner of working with stakeholders to achieve the desired results. These contexts are then examined through the co-creation lenses to better understand how and in which part of the process the collaborative approach has been adopted. The third step consisted of interpreting the data collected through the literature review and case studies. The interpretation led to the development of a descriptive framework for listing co-creation initiatives in circular cities. In particular, this research built on the co-creation design framework defined by Frow, Payne and Storbacka (2011). By examining the evolving co-creation framework against existing literature-based theory and case studies, we identified nine specific co-creation practices in circular cities. Furthermore, this research outlines three additional categories that are not included in previous studies relevant to co-creation in circular cities: co-vision, co-prototyping and co-sense, mainly related to the strategic aspects of the co-creation process. Finally, the circular economy actions (i.e. regenerate, share, optimise, loop, virtualise and exchange) and the co-creation practices with actors and tools are integrated into the framework we propose.

Co-vision, co-prototyping and co-sense as co-creation activity categories: The first research result

The case study analysis was carried out first to understand how the co-creation categories that emerged from the literature review are being adopted in circular cities. Second, it contributes to understanding how co-creation supports the transition towards circularity at different stages, from the strategic level to the execution level. Based on Frow, Payne and Storbacka's framework, we initially considered the following co-creation practices: (1) co-conception of ideas, (2) co-design, (3) co-production, (4) co-promotion, (5) co-maintenance, (6) co-experience, (7) co-pricing, (8) co-distribution, (9) co-outsourcing, (10) co-disposal, (11) co-meaning creation and (12) co-consumption. By analysing the initiatives carried out in these six circular cities, some of the categories proved to be consistent with the urban level, whereas others were limited to business activities. Consequently, we streamlined the list of co-creation practices to the following: (1) co-conception of ideas, (2) co-design, (3) co-production, (4) co-promotion, (5) co-maintenance and (6) co-consumption. Also, another three practices were introduced to describe essential aspects that emerged from the research: co-vision, co-prototyping and co-sense. While they are not explicitly mentioned in the cases that we investigated, we consider them as strategic practices (see Table 1) as far as the realisation of a future-proof city is concerned.

Co-vision initiative

In the movement to achieve a future-proof city, co-creating a shared vision becomes crucial. Methods include enabling collaborative processes, creating awareness and, at the same time, raising hope amongst people. Building on previous research and case studies, it is evident that developing circular economy guidance systems and making the circular economy concepts knowable for citizens and other stakeholders is fundamental. Such practices may include showcasing the city's circular projects online, hosting awareness-boosting green events/festivals and running campaigns to encourage new habits. Likewise, creating a collaborative vision means supporting future actions and culture, e.g. reinforcing education and training for future generations to equip them with the necessary skills to act in a circular city (Jonker et al., 2018; Russell et al., 2020). With consistent goals shared by stakeholders, co-vision is the core of a city's entire transformational process. Moreover, co-vision can activate collective optimism, especially in the co-design process, and visualisation is a powerful means used by designers in this stage. As Sangiorgi (2011) points out, designers can work from the outside in, providing future visions and intervening more systematically from a higher level so they are considered essential resources. Thus, this research interprets co-vision as a shared vision among civic society and main stakeholders, which can vary from municipality to municipality, depending on the local context.

Co-prototyping initiative

Participatory prototyping is one of the main activities carried out through collective co-designing. Such a way of prototyping, no matter whether rapid or slow, can stimulate situations and create community awareness (Selloni, 2017). When applied to services, prototyping activity is about making services visible, to learn and communicate about services and identify them as a collaborative effort (Blomkvist & Holmlid, 2010). Prototyping is led by designers who possess the capability to design and develop mock-ups, physically or digitally, and can ensure a certain level of aesthetic and/or authentic quality (Selloni, 2017). These prototypes can be seen as an artistic intervention (Selloni, 2017), allowing people to experiment and communicate efficiently through physical or virtual mock-ups. Working as a team for brainstorming and taking decisions together is the typical design intervention type. As Selloni (2017) puts it, "creating service prototypes is necessary not only to test solutions but also to reinforce the idea of making services together within a community" (p. 153). Co-prototyping initiatives are mainly carried out in a real-world setting. For example, Urban Living Labs, Fab Labs, and maker spaces gather multiple stakeholders of multiple specialities, interacting as co-innovators for experimenting, creating and prototyping (Westerlund & Leminen, 2011). Building on the research of Selloni (2017), co-prototyping in this research is understood as two or more actors jointly collaborating to propose innovative solutions (products or services) and run them in a flexible and co-creative way with mock-ups or service rehearsals (Selloni, 2017).

Co-sense initiative

From the case studies, we found that co-sense activity is happening in "advanced" cities, where resources are concentrated, and economic and technology development are relatively thriving. The so-called co-sense activity, built on participatory sensing, has been promoted in recent years because of the widespread use of affordable digital equipment. Because of the advancement of information and communication technology and global social networks, participatory sensing has become popular. In the past, institutions benefited from the data collected by citizens by providing them with technological equipment. Nonetheless, nowadays, local problems are presented by grassroots initiatives in the community where civic groups actively take solutions and action. Considering this, practical skills are required to solve shared problems. These emerging challenges have led to rising interest in using design in participatory sensing technologies and cooperation programmes (Tangmunarunkit et al., 2015; Lukyanenko et al., 2016). Design, in this respect, allows the local community to participate in such a process with little top-down legislation and

informal bottom-up initiatives. In addition, knowledge exchange and co-creation are two crucial elements regarding environmental awareness enhancement and action adoption (Coulson et al., 2018), which can be done by conducting workshops and meetups to encourage participation and develop learning and knowledge in areas such as sensors, data visualisation and interpretation. As labelled by the authors, co-sense activity refers to two or more actors collaborating on using daily and readily accessible technology to detect and collect data for tackling common issues.

Co-creation initiatives in circular cities

In total, nine types of co-creation practices were identified, which can be divided into two main groups. First, regenerative co-creation (Oertzen et al., 2018) relates to new measures and co-creation forms in the early stages (i.e. in the strategic phrase) of the service development process. In this study, regenerative co-creation practices promote circular economy actions and trigger innovation within the circular city. To be specific, regenerative co-creation practices comprise co-vision, co-conception of ideas, co-design, co-prototyping, co-production and co-promotion, and they can foster new cooperation channels among different actors. Second, operative co-creation (Oertzen et al., 2018) refers to user-specific and service-related events that may occur several times, leading to incremental innovation. Operative co-creation practices encompass co-maintenance, co-consumption and co-sense. The following section describes the nine types of co-creation practices about the initiatives mapped in the six case studies mentioned above.

1. Co-vision

Depending on regional conditions, co-vision is a vision of the desired future shared by the municipality, civic society and related stakeholders. Usually, the city-level roadmap follows its national guideline. Taking a leading role in the circular economy transformation movement, the Netherlands' national goal is to be fully circular by 2050 and to cut down half of raw materials by 2030. Many community-owned circular economy initiatives in Amsterdam adhere to the national strategy. Brussels aims at resource efficiency to help stimulate the economy to boost entrepreneurship and create new employment opportunities. The city of Glasgow's vision is to become one of the world's first circular cities, creating a movement to inspire businesses of all sizes to innovate and become future-proof by adopting circular strategies (EIT, 2018). All six cities under investigation show their efforts to support co-vision activity. It is worth mentioning that Ljubljana has involved multiple stakeholders facilitating circular economy practices. For instance, open forums, green events and stakeholder engagement conferences are the main media in which municipalities can rely on communicating and sharing the same vision with other stakeholders for a sustainable lifestyle.

2. Co-conception of ideas

Co-conception of ideas refers to two or more actors collaborating on concept innovation. One large-scale crowdsourcing example is *Circular Glasgow*, launched by the Glasgow Chamber of Commerce. *Circular Glasgow* aims to engage local businesses involved in the production of major city events and conferences. This ongoing project promotes circular economy ideas related to global challenges by inviting individuals and businesses to contribute circular ideas within the events sector online. In the end, the challenge received 60 ideas from 13 countries, and these works are in progress to support the implementation of resultant ideas and solutions. Correspondingly, the call from *"Be circular—be Brussels"* launched by Brussels-Capital Region aims to support self-employed people and businesses in their creativity and develop economic activities that benefit the environment and local jobs. Innovative ideas have been collected from this call, and more than 40 companies and start-ups have been awarded financial and service support.

3. Co-design

Co-design refers to two or more actors/designers sharing their design perspectives, respectively, especially in the "fuzzy front-end" phrase. Co-design activities take place in all cities examined at various levels of involvement. Citizens explore possibilities and gain inspiration by co-design practices related particularly to collaborative workshops. Remarkably, the city of Helsinki appeared very active in co-design activities focusing on intelligent transportation. In the district of Jätkäsaari, designers engaged residents in solving local mobility challenges. Jätkäsaari offers a living lab and urban testbed for innovative mobility development in Helsinki. Numerous pilots, experiments and projects have been conducted in the lab, focusing on innovative mobility services, traffic safety, mobility data, and behaviour change. Residents are actively involved in living lab activities and a web-based survey concerning mobility challenges and people's opinions about the services. The results were elaborated on in four open workshops with the residents and traffic planners involved (Forum Virium Helsinki, 2020). A dedicated website (*jatkakokeilee*) was created to inform the ongoing process for residents and encourage their participation.

4. Co-prototyping

Building on the research of Selloni (2017), co-prototyping in this research means that two or more actors collaborate in proposing innovative solutions and running them in a flexible and co-creative way with mock-ups or service rehearsals (Selloni, 2017). For example, a model in the Smart Kalasatama district of Helsinki—the Agile Piloting Programme—has been developed to experiment with new services and technologies in a co-creative way. This programme engages companies, residents, the public sector and other stakeholders to experiment with new solutions responding to environmental issues in a real-life environment (e.g. city districts, schools, hospitals, etc.). The piloting teams prepared and co-developed their agile pilot within the urban lab. Agile pilots are fast experiments of early prototypes running for a maximum of six months. Moreover, a facilitated platform is available for collaboration with the whole ecosystem, aiming to learn as much as possible (Forum Virium Helsinki, 2020).

5. Co-production

Co-production emphasises an equal and reciprocal partnership (Boyle & Harris, 2009) between users while delivering public services. Co-production activity occurs in digital or physical spaces (e.g. Urban Living Labs, Fab Labs, maker spaces, incubators, innovation hubs, etc.), and distributed urban production systems, enabled by new technologies, are necessary to explore the potential for a new dynamic of the city. In the city of Amsterdam (the Buiksloterham district, where the Circular Neighbourhood Action Plan is implemented), a set of resources is available for local residents and developers to translate higher-level goals into everyday activities. Here, an entirely circular community called De Ceuvel is situated in the city. It is a participatory urban living lab of a self-sufficient community, where designers, enthusiastic citizens and other actors generate synergies and partnerships.

6. Co-promotion

Co-promotion is described as two or more actors collaborating on promotional activities related to a specific product, brand or entity. Examples include the municipality of the Gothenburg, which aims to strengthen its ability to push, co-operate, communicate and support the transformational work required to achieve the desired results with many stakeholders. On the other hand, Helsinki works towards finding, co-creating and demonstrating innovative, practical solutions that are climate-positive, smart with resources and improve people's wellbeing (EIT, 2018). Unlike the other five northern European cities in the case study, Ljubljana uses a different strategy to achieve a circular city. The title of European Green Capital has significantly strengthened Ljubljana's recognition worldwide and upgraded the city's brand. Twenty-four ambassadors were appointed to raise awareness among citizens, involving them in the process

of making Ljubljana more environmentally friendly (City of Ljubljana, 2016). It is clear from this case that forming and sharing ideas of the future is crucial for a successful and smooth process of co-creation.

7. Co-maintenance

In circular cities, co-maintenance is related to two or more actors sharing either the maintenance service or a core product or service. Co-maintenance stems from the concept of the repair café, operating within the framework of the Reuse Centre, which entails the involvement of experts in different professions (e.g. electricians, sewists, carpenters, etc.) and volunteers to help repair and refurbish products. Although repair café can be commonly seen in these circular cities, the large-scale Alelyckan recycling park in Gothenburg provides residents with a platform where they can sell their unwanted items and pick up some bargains amongst things that are judged to be useless or unnecessary by others.

8. Co-consumption

Co-consumption involves collaboration during usage, as actors employ their resources (physical, social or cultural) individually or collectively, when co-consumers determine and enhance their own consumption experiences. It is implemented widely in these six cities to reduce mobility demand by releasing developers from the high parking requirements currently in the area and investing in additional alternatives and shared mobility. To give an example, the city of Gothenburg consists of an exciting mix of sharing services (part of the Smart Map project) initiated by companies and civil society. Such services were created as part of an innovative civil-public partnership, which is a tool that maps the sharing economy in Gothenburg, including over 100 sharing initiatives, such as bike kitchens, co-working spaces, digital services, a toy library, mobility pools, clothes swapping days, etc.

9. Co-sense

Co-sense activity, as labelled by the authors, refers to two or more actors collaborating on using daily and readily accessible technology to detect and collect data. These types of activities are widespread in the cities of Amsterdam, Helsinki and Glasgow. Impressively, in Amsterdam, the Smart Kids Lab allows children to observe the environment (e.g. soil, liquid and air) by using small-scale tests and self-made sensors enjoyably. An online platform assists these young citizens to perform tests and helps them compare the results with downloadable materials. On the other hand, over the last few years, Glasgow—together with Innovate UK—has been developing several initiatives to demonstrate the technology potentiality offered by intelligent technology. In Glasgow, open data is utilised from various sources across the city; citizens can create or update their open dashboard from hands-on digital widgets (Glasgow City Council, 2021).

	Amsterdam	**Brussels**	**Glasgow**	**Gothenburg**	**Helsinki**	**Ljubljana**
Co-vision	x	x	x	x	x	x
Co-conception of ideas	x	x	x	x	x	x
Co-design	x	x	x	x	x	x
Co-prototyping	x	x	x		x	
Co-production	x	x	x	x	x	x
Co-promotion	x	x	x	x	x	x
Co-maintenance	x	x	x	x	x	x
Co-consumption	x	x	x	x	x	x

Co-sense	x	x	x	x

Table 1: Co-creation activities examined in circular cities.

Stakeholders and tools

As described above, all forms of co-creation initiatives rely on the active participation of two or more actors (Frow et al., 2015). It is crucial to have distinct roles, competencies and engaging platforms that make co-creation work effectively (Ramaswamy & Gouillart, 2010). Based on the literature and case studies, seven relevant actors and three leading engagement platforms were identified in the mutually beneficial co-creation practices. Seven actor groups were classified, including:

(1) Municipalities: the authorities act as promoters of integrated initiatives and interconnect resources with other actors. Following the scope of their circular economy strategy, government engages the broader society in circular economy activities. It tries to communicate with the public about its activities and environmental impacts (OECD, 2020).
(2) Business sector: businesses as enablers of new business models for implementing circular economy concepts to advance more inclusive evaluation of their supply chains (World Economic Forum, 2018); as content providers that foster sharing, reusing or recycling; and provide repair, maintenance and remanufacturing services.
(3) Knowledge institutes: academia and research centres with specialists are key partners contributing to creating circular Economic knowledge to promote educational purposes.
(4) Non-governmental organisations (NGOs): NGOs deliver on capacity-building projects and raise awareness of circular economy practices (OECD, 2020), e.g. creating an online circular observatory to share information on the circular economy and monitor citizens' level of engagement to promote reuse behaviour and raise awareness.
(5) Citizens: citizens are co-implementers involved in services that used to be carried out by the government; citizens behave as co-designers of the content and process of service delivery; citizens also act as initiators, taking up the initiative to formulate specific services (Voorberg, Bekkers & Tummers, 2015), e.g. residents provide repair, maintenance and remanufacturing services in their community.
(6) Local experts: accessible experts who are familiar with the local situation can help other actors by providing appropriate information and advice.
(7) Designers: designers contribute in several ways, from advocating cultural/organisational change to supporting specific collaborative processes, aiming at human-centred solutions. Designers' contributions are crucial for inspiring people and enhancing people's imagination and visions of a better future (Selloni, 2014).

On the other hand, the analysis of co-creation practices showed how the initiatives are supported and enabled by different engaging platforms. Effective co-creation typically requires an engagement platform (Ramaswamy & Gouillart, 2010), enabling actors to share their resources and adapt their processes. Platform is often used to refer to a complex network that enables innovation (Zahra & Nambisan, 2011). In some cases, the circular economy co-creation platforms are part of the municipal website itself. For example, the *Think Sustainably* digital service of Helsinki resembles a regular city guide but puts environmental sustainability as the primary factor (Aouf, 2019). In this study, an engagement platform is considered a tool for enabling productive co-creation, intentionally brought to the co-creation context by the leading actor. Three clusters of engagement platforms can be identified:

(1) Digital resources: refers to a digital application for interactions with diverse actors (Sawhney, Verona, & Prandelli, 2005) and coordination of strategies for promoting collaboration between different actors; sharing economy platforms, enabling a new form of co-creation for facilitating economic transaction and creating mutual benefits (e.g. car sharing software); and platforms provided by critical circular economy networks (e.g. EMF, C40, ICLEI, etc.) for co-producing and translating relevant knowledge.

(2) Physical resources: refers to spaces where collaborators can be brought together to contribute to co-design or co-prototyping activities. Physical spaces (e.g. Urban Living Labs, Fab Labs, maker spaces, incubators, innovation hubs, etc.) play an essential role in stimulating co-creation practices, including the municipality transforming iconic buildings into attractive platforms to facilitate co-creation culture in the metropolitan area.

(3) Events and festivals: green events and festivals are staged to encourage visitors to adopt more sustainable lifestyles and behaviours, usually financed and organised by local authorities (Mair & Laing, 2013). Green events are defined as a type of event characterised by the integration of sustainability guidelines into their planning, organisation and management processes (Tölkes & Butzmann, 2018).

In conclusion, leading municipalities collaborate with NGOs, knowledge institutes, local experts and designers to promote citizens' and businesses' acceptance and awareness of the circular economy through proper tools to refine the whole process and boost innovation. Additionally, designers can intervene to reduce the gap between top-down and bottom-up actions, playing the role of cultural operators (Manzini, 2015) that foster systemic and cultural changes. When involved in participatory projects, the character of designers is shifting from facilitators, translators, interpreters, guides and visualisers to provokers, triggers, change makers and actionists (Selloni, 2017). On the other hand, city stakeholders' concrete interventions need the support of engaging platforms, which are important for gaining insight and proposing ideas to make things come true eventually. Engaging platforms work as both physical/digital resources and goal-oriented events/festivals dedicated to co-creation activities and prototypying circular solutions in the cities. Based on the case studies, it is beneficial to apply co-creation to transformational practices for integrating people and resources.

A circular city co-creation design framework

This research provides insight from case studies and the literature, coming up with an actionable method to propose a shared co-creation framework for future circular cities. Municipalities have acknowledged the importance of cross-chain and cross-sector collaboration and have started to adopt co-creation processes based on regional differences (EMF, 2015). However, municipalities lack a shared approach—in terms of process and tools—to systematise the current knowledge. To fill this gap, we propose the circular city co-creation design framework (see Figure 1), which includes nine co-creation categories for sustainable development with the stakeholders involved, seeing circular economy principles as the goal. The elements constituting the framework are listed according to the emerging practices revealed from the case studies. The ReSOLVE model labelled by the Ellen MacArthur Foundation is regarded as the principle of carrying out a circular city in the circular city co-creation design framework.

The ReSOLVE framework aims to transfer the circular economy principles (preserve and enhance natural capital, optimise resource yields and foster system effectiveness) into six concrete actions, i.e. regenerate, share, optimise, loop, virtualise and exchange. The framework proposed by the authors includes seven

categories of potential actors (i.e. the municipality, businesses, knowledge institutes, NGOs, citizens, local experts and designers) that may engage in co-creation practices. Additionally, three main engagement platforms are identified and added to the framework—considered as engaging platforms—with the purpose of providing virtual resources, physical resources and green events/festivals for communication, participation, experimentation and further innovation. In the framework we propose (see Figure 1), nine practices are included and clustered into two major groups:

- Regenerative co-creation practices (i.e. co-vision, co-conception of ideas, co-design, co-prototyping, co-production and co-promotion) intensify the strategic part of innovation to facilitate the implementation of the ReSOLVE framework (EMF, 2015); and
- Operative co-creation practices (i.e. co-maintenance, co-consumption, and co-sense) provide implementation strategies, balancing top-down municipal power and bottom-up efforts from the private and public sectors within the regional area.

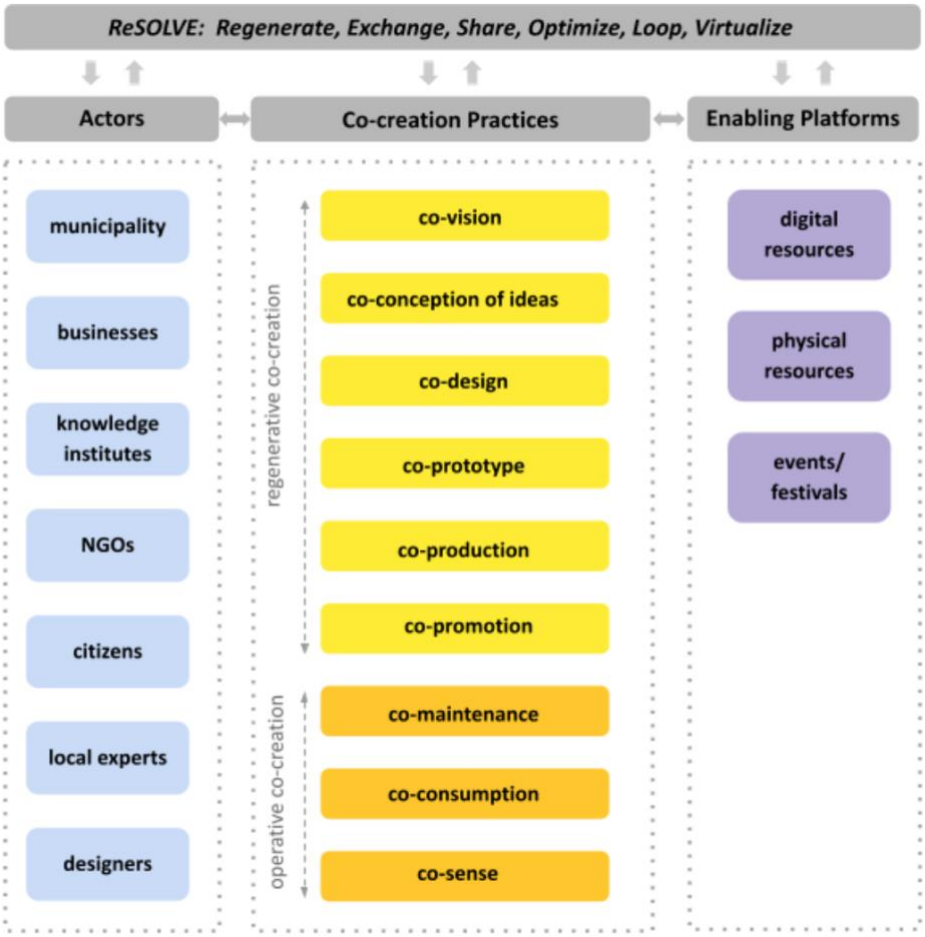

Figure 1: Circular city co-creation design framework, adapted from the ReSOLVE framework (EMF, 2015).

This framework generates potential circular economy activities, drawing co-creation design methods to inspire further innovation and boost circular economy imaginaries in cities. While previous research and municipal reports stress the importance of a collaborative manner and partnership, a feasible and thorough examination that can be adapted to different geographical scales is overlooked. Nine co-creation practices were grouped into two categories. To intensify the strategic part for further implementation, six regenerative co-creation practices were discerned. Co-vision refers to a clear vision shared by stakeholders in line with the city's comprehensive future strategy. As with Ljubljana's experience, multiple stakeholders

have been involved in realising a sustainable urban future. Co-conception of ideas refers to two or more actors collaborating on concept innovation; two typical examples can be seen from Glasgow and Brussels. Co-design is a creative process that refers to two or more actors sharing their respective design visions when co-creating solutions. An iconic example of large-scale co-design is the district of Jätkäsaari in Helsinki. Co-prototyping describes how two or more actors jointly collaborate to propose innovative solutions (services or technologies) and run in a flexible and co-creative way with physical mock-ups or service rehearsals (Selloni, 2017), such as Helsinki's Agile Piloting Programme. Co-production describes how two or more actors collaborate jointly in public service delivery. For instance, in the Buiksloterham district in Amsterdam, where the Circular Neighbourhood Action Plan is implemented, a set of resources is available for residents and developers to translate higher-level goals into everyday activities. Co-promotion is described as two or more actors collaborating on a specific product or brand's promotional activities. As a unique example, the title of European Green Capital has significantly strengthened Ljubljana's recognition worldwide and upgraded the city's brand.

Furthermore, three operative co-creation practices provide implementation strategies, balancing top-down municipal and bottom-up efforts from the private and public sector. Co-maintenance indicates two or more actors sharing either the maintenance service or a core product or service. Repair cafés and other maintenance centres are the most common examples in the cases examined. Co-consumption involves collaboration during usage, as actors employ their resources (physical, social or cultural), individually or collectively, when co-consumers determine and enhance their own consumption experiences. For instance, the city of Gothenburg consists of an inspiring mix of sharing services (part of the Smart Map project) initiated by companies and civil society. Co-sense practices, which are widespread in Amsterdam, Helsinki and Glasgow, denote two or more actors collaborating on using daily and readily accessible technology to detect and collect data. Since these three co-creation practices depend heavily on the contextual resources' characteristics, it is essential that actors who have deep knowledge and understanding of local resources are included in the discussion. Overall, grounded on tangible examples, the circular city co-creation design framework (Figure 1) provides city stakeholders (mainly the municipality) with a concrete method of performing co-creation initiatives.

Concluding remarks

This paper describes co-creation as a practical approach in circular cities, focusing on different co-creation initiatives. Case studies allow the identification of the implementation of recommended circular economy co-creation practices in urban systems and a selection of actors and tools to take into consideration. The circular city co-creation design framework provides a design approach to apply co-creation activities in circular cities. Regenerative co-creation practices (i.e. co-vision, co-conception of ideas, co-design, co-prototype, co-production and co-promotion) intensify the strategic part of generating ideas to facilitate the implementation of the ReSOLVE framework inside cities. Conversely, operative co-creation practices (i.e. co-maintenance, co-consumption and co-sense) provide implementation strategies and balance top-down municipal efforts and bottom-up trials from the private and public sectors.

A growing body of research shows the contribution of design towards the implementation of circular economy strategies. Frameworks, tools and strategies are developed from the design field to scale up these circular economy initiatives (Fleischmann, 2020; McAloone & Pigosso, 2017; Wastling et al., 2018) from the local level to regional and national ones. Part of the design nature emphasises a participatory manner, since it has widened its practice from co-design with staff and users to collective design by all actors (Vink et al., 2020). Design approaches, such as systemic design, transformation design and transition design, embed futurist qualities, including transformative capacity (Burns et al., 2006; Irwin, 2015; Jones, 2018; Sangiorgi,

2011), which are required in the transformation process to realise a future-proof city. This also means that co-creation processes that involve multiple stakeholders at various levels and with diverse competencies are part of such a transformation. In this perspective, designers can contribute to advancing such processes more than facilitating, envisioning and supporting. The framework we proposed provides detailed co-creation forms based on actual initiatives; it helps this transformation process in realising a future-proof city. Nevertheless, it could encounter practical issues when applied to various cities. Previous research has already pinpointed the difficulty and limitation of collective co-creation work, considering the time and effort devoted. Furthermore, when projects are transferred from designers to local communities, it is difficult to maintain the same quality and aesthetics of the artefacts or services. All the above issues reflect the obstacles to putting co-creation into practice.

This co-creation circular city framework has been developed to inform what variables and alternatives can be chosen and implemented when applying co-creation methods at the municipality level. However, a few restrictions were identified in this research. First, this co-creation circular city framework remains exploratory, as further validation from policymakers and participants in a broad circular economy discussion is needed. Second, the effectiveness of this framework is hard to assess, as the degree of urban sustainability cannot be evaluated. Third, the circular economy is still in the developing phase, and the ReSOLVE framework that we used as a reference model in this framework does not entirely fit the urban context. It is also unknown whether the circular cities we analysed will become genuinely circular, although they had proven outstanding achievements and grounded long-term plans. Besides, while we evenly choose samples from the clusters of advanced, in progress and newcomers cities, these municipal samples are not dynamic enough. They are limited within the European context, including relatively prosperous cities concerning educational, financial and social development.

This framework outlines an open scenario in which each of the phases and co-creation categories accompanying the transformation towards circularity needs to be further explored in practice from a design perspective. Further research may be conducted on this issue from a systemic view and at the international level. To generate systemic change globally, improved coordination across multiple levels of government is required. Innovation in the circular economy requires a systemic approach where authorities must act as key facilitators, stimulating co-creation initiatives with key actors. It is essential to promote new models and integrate alternative sources where people can actively participate in the path towards a sustainable urban future. Both capacity building and knowledge sharing are crucial for fostering systemic innovation processes. While there is much work to be done, there is also a clear need to build on existing knowledge developed from design fields.

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Domestic kitchen design as a tool to reduce food waste

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Domestic kitchen design as a tool to reduce food waste

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Abstract

This paper describes broader research undertaken for a master's degree in product and space design at IADE, Universidade Europeia, Lisbon, Portugal. It aims to define guidelines for the development of domestic kitchen projects that contribute to reducing food waste. After this research, our goal is to further develop its outcomes through future research and the implementation of the resulting guidelines in a lifesize field experiment. We departed with the hypothesis that space design may influence users' behaviour; therefore, it can be used as an active tool in favour of sustainability. We defined a methodology that informed a review of the literature, case studies and surveys. We analysed comprehensive themes regarding the problem, which enabled a holistic approach to the issue. We conclude this paper by showing the pertinence of our research proposal, a novel way of combining specific strategies from three primary areas of knowledge (design for behavioural change, food waste and interior design) to achieve our goals of reducing food waste in domestic kitchens and contributing in this way to a more sustainable society.

Keywords: Sustainability, Kitchen design, Food waste, Design for behaviour change, Interior design

Introduction

This paper presents the initial stage of a master's research project based on the hypothesis that space design, as an influencer of human behaviour (Sommer, 1969), can act as a tool to contribute to food waste reduction in the context of domestic kitchens. At the same time, we study how space can change behaviour and how it has the potential to reduce waste with these changes. We aim to define guidelines that serve as a source of information for professionals in the sector.

We defined Portugal as the study context, more specifically the area of Lisbon. This choice is supported by both the data—according to which Portugal currently wastes 17% of the food produced for human consumption, which corresponds to 1 metric tonne per year (Baptista, Campos, Pires, & Vaz, 2012)—and by the limitations in scope and time of the study, which is being developed over one year. The research is based on a deductive approach followed by a non-interventionist methodology.

At first, we point out that, as shown by Ponis, Papanikolaou, Katimertzoglou, Ntalla and Xenos (2017), food waste impacts mean land, energy and water waste. In this context, it is essential to differentiate between the concepts of loss and waste. The concept of loss is a natural result of the inefficiencies in the production and industrial system (Baptista et. al., 2012), while waste is "the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food service providers and consumers" (FAO, n.d.), i.e. what could be avoided through better management and behaviour.

Considering the above, we focus on the domestic scale, with families as the main subject. FAO (n.d.) estimates that about one-third of all food produced in the world is wasted. According to the organisation's 2011 report, in 2009, Europe was responsible for 22% of this waste, 52% of which was at the consumption stage of the chain (Figure 1). These numbers show what Baptista and colleagues (2012) mean by saying that it is in families that food waste proves to be higher. Also, it justifies our choice of study, as the transition to sustainability will be a big and articulated process of social, cultural and technological innovation (Manzini & Vezzoli, 2002).

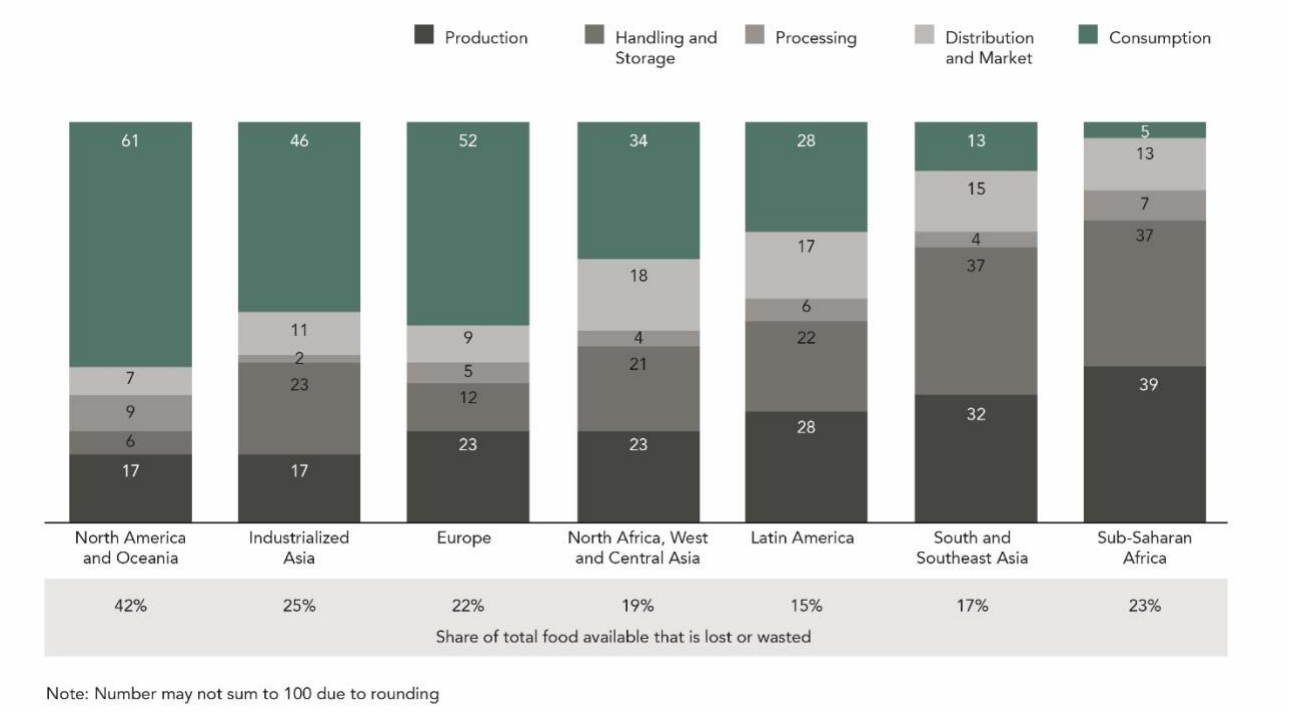

Figure 1: Food lost or wasted by region and stage in the value chain, 2009 (Percent of kcal lost and wasted) (adapted from Lipinski, Hanson, Waite, Searchinger, Lomax, & Kitinoja, 2013).

Furthermore, we pursued a bottom-up strategy: that is, consumer awareness actions have a relevant impact throughout the supply chain. Aschemann-Witzel, De Hooge, Amani, Bech-Larsen and Oostindjer (2015) recognise that there must be a synergy of action in all stages of the chain, but they state that the consumer has a crucial role in this change. They exemplify this impact by showing that "retailers apply aesthetic standards to accept or reject foods based on the assumption that consumers will only buy foods fulfilling these standards" (2015, p. 6458).

In parallel, we identified a disconnection between sustainable behaviour and environmental awareness (Junior, da Silva, Gabriel, & de Oliveira Braga, 2015; Kollmuss & Agyeman, 2002; Kraus & Emontspool, 2017). That is, there is a gulf between the information disseminated through environmental education and society's practices and choices. Considering this, we propose an innovative approach seeking to comprehend the relationship between consumers' space at the domestic scale (the kitchen) and their attitudes related to food waste. This approach is supported by the concept that space design has a significant role in behaviour change (Cummings, 2012; Montazeri, Gonzalez, Yoon & Papalambros, 2012; Scott-Webber, Konyndyk, French, Lembke & Kinney, 2017; Wu, DiGiacomo & Kingstone, 2013).
It is a promising strategy when it comes to the reduction of food waste.

Thus, we understand the kitchen as a system and not just as a set of appliances and storage spaces. Hebrock and Bocks (2017) show that the solutions currently available explore mostly smart fridge functions and packaging, with very low diversity. They conclude that “there is great potential for more innovative thinking that can challenge existing practices more profoundly” (p. 390).

Therefore, the design of a kitchen that aims to be more sustainable must consider not only its production but also how it will be used and how it can change habits. After all, as Cummings (2012) argues, it is necessary to create a favourable environment to promote sustainable behaviour, making these activities as convenient as possible.

Literature review

Design for sustainability and behavioural change

In 1963, environmental concern was marked by the launching of R. Buckminster Fuller’s work, Operating Manual for Spaceship Earth, in which we identified a call for a design revolution to guide the world towards a more sustainable future.

Later, Papanek and Fuller (1972), in Design for the Real World: Human Ecology and Social Change, highlighted the role of a tool for social and environmental change. In 1978, Gui Bonsiepe’s work, Theory and Practice of Industrial Design: Elements for a Critical Manual, established the link between the study of sustainability and industrial practice.

In Monteiro (2019), we noted a novel approach that aims to draw attention to the impact of design and its choices on the world. In Walker (2012), we identified the goal of creating a material culture with more value. Similarly, Manzini and Vezolli (2002) proposed new forms of production compatible with the environment, aimed at a new consumer society. They advocated for the need to change development parameters so that development is not measured in terms of production and consumption but according to the reduction of these.

In the same way, we understand that one must also consider new ways of organising daily life, the sustainable aspect of the product as a cycle and consider how a product influences its users. Besides, the development of design for sustainability aims at promoting a fundamental change in user behaviour (Manzini, 2015), so to determine the strategies for this “there is a need to understand behaviour and its determinants” (Strömberg, Selvefors & Renström, 2015, p. 163).

When addressing the consumer, the works of Junior and collaborators (2015), Kraus and Emontspool (2017) and Kollmuss and Agyeman (2002) investigate the relationship between the possession of knowledge and tools for sustainable behaviour and the behaviour itself. That is, trying to understand how to reduce the gap that exists between them. These authors also point out that it is complex to understand why people choose environmentally responsible attitudes and to identify the barriers to adopting more appropriate behaviours.

In this research, we highlight one of these determinants, which is space, whose impact on its occupant has long been demonstrated by environmental psychology studies (Scott-Webber et al., 2017). The literature review shows examples of these impacts on behaviour in research related to health and well-being spaces (Petermans & Pohlmeyer, 2014; Ulrich, 1991), workspaces (Vischer, 2008) and educational/ library spaces (Campbell & Schlechter, 1979; O'Kelly, Scott-Webber, Garrison, & Meyer, 2017; Scott-Webber et al., 2017).

As far back as 1969, Sommer drew attention to the lack of emphasis given to activities developed in internal spaces and how the configuration of the latter can impact them. For Sommer (1969), "not only must form follow function, but it must assist it in every way" (p. 5). In the same sense, Augustin, Frankel and Coleman (2009) stated that the design of a physical place influences its user and, therefore, it can shape his/her attitudes and behaviour. The latest well-designed spaces in general are compatible with the planned activity; communicate vital information about their users; are comforting to the psychological needs of their users; are challenging by presenting opportunities for individual development; and are continuous in time, evolving and adapting to new needs.

In the field of sustainable interior design, Stieg (2006) points out the need for a connection between theory and practice, analysing the difficulties of the interior designer to act responsibly. In the same sense, Maté (2006), Bacon (2011), Aktas (2013) and Hayles (2015) discuss the concepts of green interior design, the difficulties related to the specification of sustainable materials and the understanding of the project in all its cycles.

In Portugal, it is relevant to mention the work of Vicente (2012), who studied furniture production processes to create information and support tools for a more sustainable practice. One of his main conclusions is that it is necessary to facilitate the work of the designer with the proposition of tools that are integrated into the product development process. In the same way, this research aims to build knowledge to give support to the professional, which is much aligned with our own goal for the development of the guidelines.

Food waste

When it comes to the food consumption chain, Bagherzadeh, Inamura and Jeong (2014) point out that, worldwide, the household scale is responsible for wasting 38 metric tonnes of food per year, or 76 kg per capita per year. In Portugal, a study conducted in 2012 by Baptista and colleagues pointed out that 1 metric tonne of food produced for humans is lost or wasted per year (see Figure 2). Of this amount, it was estimated that about 314,000 tonnes are wasted on a domestic scale, i.e. about 32 kg per capita per year.

Figure 2: Food losses in Portugal by year (adapted from Baptista et al., 2012).

Several studies have sought to understand the causes of food waste in different settings, as well as the search for viable solutions to the problem (Aschemann-Witzel et. al, 2015; Ponis et al., 2017; Visschers, Wickli & Siegrist, 2016). The results reaffirm that behaviours related to food choices and food handling are major influences. Furthermore, they point out that it is essential to increase consumers' awareness of the issue and how individual choices impact the whole. Aschemann-Witzel and colleagues (2015) concluded that there are three main focuses of action for effective change: (i) date labelling; (ii) expectations and

perceptions; (iii) and consumer behaviour in food handling at the household scale. The last point is pointed out by the authors as central, being the focus of action in this investigation.

Hebrok and Boks (2017) divide the existing solutions in the field of design according to how they act, namely: information and knowledge, packaging, food risk and regulations. The authors conducted an extensive review, cataloguing and categorising studies to find potential intervention points. They show that several factors lead to waste, related both to behaviour (preferences, ideals, culture and convenience, for example) and to the physical structure of kitchens (ways of home food storing and packaging, for example). Here we propose a more comprehensive analysis of the issue by trying to understand how these various solutions interact with each other. We will update and discuss these results.

Kitchen-focused interior design

In this research, we address the kitchen as a dynamic and central space in the daily life of the Western family. Despite historical differences between contexts, it is possible to say that, today, this environment is the stage for technological revolutions and new activities that reconfigure domestic dynamics. Considering this, Bell and Kaye (2002, p. 46) call attention to the need to think of it "not just as a collection of wires, appliances, and Internet points, but as a space in which people live."

Freeman (2004) points out that kitchen space is a very rich field of exploration between the past and the future of our society, illustrating the potential of design in understanding man as a social creature. Bell and Kaye (2002) agree with this point of view and add that the kitchen space, the act of cooking and food itself constitutes a set of cultural icons, being employed as metaphors for more complex meanings and actors throughout history.

The understanding of the kitchen space as home, as centre and the result of social relations, is a subject treated by Bell and Kaye (2002), Freeman (2004), Bech-Danielsen (2012) and Shove (2007). In Freeman (2004), we realise how the kitchen space has become determinant to the development of modern society; in Bech-Danielsen (2012), we see how everyday life has changed the way people see residential architecture, with a focus on the kitchen. For that reason, in this research, we seek to understand the dynamics of the kitchen in our context to add a new layer to the functionalities of this space, to combine rationalism with the fight against food waste.

Methodology

As mentioned, this research aims to develop guidelines that support kitchen design towards more sustainable behaviour, focusing on food waste reduction. This study consists of a mixed methodology with two phases: deductive and analytical. First, in the deductive phase, we will consolidate knowledge about the subject, which will then serve as the basis for the second phase, which will result in the formulation of interior design guidelines. To this end, we seek to answer the following research questions:

a. How can interior design contribute to more sustainable behaviour when preventing food waste?
b. What are the factors that influence users' behaviour regarding food waste in a domestic kitchen?
c. How are users' food consumption and handling habits related to the design of the kitchen?

To answer question a, we carried out an extensive literature review, which sought themes related to "design for sustainability", "design to combat food waste" and "design for behaviour change". We intended to expand and consolidate the state of the art on the subject. Also, we sought to understand what solutions exist in the field of design, identifying opportunities for action.

On the relationship between behaviour and the environment, Wu and colleagues (2013), Cummings (2012) and Montazeri and collaborators (2012) investigated the impact and influence of space on sustainable decisions to identify how design can act to promote sustainable behaviour. In this sense, Lilley and collaborators (2006) identified three possible approaches to design for behaviour change: eco-feedback (information provision), behaviour direction (user incentive) and intelligence (imposition of limitations and directing actions). In this research, we will focus on the latter two to structure our proposed guidelines. We will work in constraining or affording actions through the space design and non-perceived solutions that guide the users.

In addition, we aim to understand how interior design can change behaviour. We selected case studies that intend to understand how space, even in other contexts, influences behaviour. From studies related to workspaces, we identified aspects that interfere with task performance, approaching our problem as a domestic task. In educational environments and libraries, we identified attributes that corroborate engagement with space and with the problem. Here are the most relevant to our investigation:

- Spatial organisation;
- Design details;
- Ambient conditions and resources;
- View and visual access of the workspace;
- Flexibility of the space divisions and furniture (to empower the user and support different needs);
- Environmental messages (to be symbolic and inspiring);
- Core connectedness (to give a sense of belonging); and
- Adaptability (to be able to change over time).

In question b, we focused on food waste at the household scale to understand the causes and potentials for action. We researched and analysed previous studies that addressed the theme in several countries, including Portugal, to identify strategic paths to solve our problem.

Question c relates to Portuguese cuisine and habits and will be answered by reviewing studies that have carried out extensive research with the population. Whitehead (2005) points out that to understand what goes on in each space, it is necessary to perceive some categories of human interaction phenomena. Amongst these, we selected the essential ones for this research:

- Space: the nature of the environment where the interaction takes place;
- Objects: what they are and how they are organised;
- Actors: who they are;
- Behaviours: acts, activities and events;
- Patterns of interaction between the actors;
- Ideational elements: beliefs, attitudes, values and significant symbolisms;
- Broader social systems: behaviours and ideations found in the specific social system; and
- Goals, motivations and agenda of the individual and the group of the actors in the social setting.

Looking for information related to actors (demographic data) and the broader social systems, we will use statistical data collected by national demographic institutes, such as PORDATA (Base de Dados Portugal Contemporâneo [Contemporary Portugal Data Basis]) and INE (Instituto Nacional de Estatística [National Institute of Statistics]).

Looking for information related to behaviours, ideational elements, goals, motivations and agenda, we will look at the results of the report Do Campo ao Garfo, Desperdício Alimentar em Portugal (From the Fields to

the Tables, Food Waste in Portugal), made by Baptista and colleagues, in 2012. Also, we will carry out surveys to obtain more specific information related to kitchens, daily habits and the relationships between users and space. In this way, it will be possible to complement the available data.

Conclusions

The research efforts have focused on the deductive phase, with an extensive literature review that sought to establish an overview of the issue. It was possible to strengthen the initial hypothesis that interior design can act as a tool for changing behaviour towards more sustainable practices. Furthermore, we were able to define strategies and justify the relevance of the research both in terms of the study setting (Portugal) and the scale of the intervention (domestic).

There is currently much media coverage on the issue of food waste, with increased concern and a sense of guilt regarding both environmental impacts and social inequalities (Baptista et. al, 2012). However, the disconnection between behavioural intentions and the attitudes themselves means that the problem needs to be approached holistically. It is of utmost importance to better understand social, demographic and cultural factors if we are to propose solutions to make this link.

In the literature review, we found several solutions in the field of product design, e.g. smart fridge, grocery list, fridge cam, smartphone connection, colour coding, apps, online advice, awareness campaigns, storage guidance, smart data labelling and edible coatings. These seek to combat the problem based on new forms of planning, stocking, packaging and informing. We sought to approach the issue from the perspective of interior design, understanding the kitchen space as a holistic system in which we can integrate innovative solutions with existing ones.

We can state that the relevant numbers regarding food waste in Portugal, presented by Baptista and collaborators (2012), firmly justify the relevance of the research. Also, the same authors state that in industrialised countries, food waste is concentrated at the distribution and final consumption levels, which reaffirms the importance of action at the household scale. Moreover, we believe that the obtained results can be considered, with appropriate adaptations, for other Western countries, with similar cultures and habits.

It is also important to add that the COVID-19 pandemic crisis has created new challenges to the academy, and introducing new tools to reduce losses and waste of food is one of them (Galanakis, 2020). According to Kantar (2020b), two trends are observed: (i) the growth of food delivery and takeaway; (ii) and the increase in the number of meals made at home, probably because of the growth of teleworking. Eurofound (2020) states that in the European Union, it is estimated that 39.6% of paid work by dependent employees was carried out at home during the pandemic. The study conducted by Kantar (2020a), comparing the months of January to August 2020 with those of 2019, showed that in Portugal, there was a 23% drop in out-of-home consumption and a 3% growth in in-home consumption (delivery and takeaway). It also showed that in France, the number of family meals per week rose from 18 to 24 during the lockdown period of 2020.

In brief, we have identified the working strategies that will guide us to our proposed outcome. Using behavioural direction and intelligence as our main approaches, we will define our guidelines. Considering who our actors are, how their actual kitchen space is, how they behave and interact, and to which social system they belong, we can propose a new type of scenario. To complete this proposition, we will need to define how to organise the space, what the main design details are, what the necessary ambient conditions

and resources are, what the visual strategies are, how to be flexible, what the main environmental messages are, how to create a core connectedness and how to be democratic and adaptable.

Finally, it is possible to conclude not only that there are solid grounds to justify the pursuit of this research but also that our main objective can be achieved, contributing to solving the problem of food waste through innovative solutions. Furthermore, it is our goal to test the proposed guidelines on a full-scale field experiment in future research.

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