

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/329542724>

Generative Design as Tool for Social Innovation

Conference Paper · October 2018

CITATIONS

2

READS

623

2 authors, including:



[Aura Cruz](#)

Universidad Nacional Autónoma de México

4 PUBLICATIONS 3 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Mexican Design History [View project](#)



Latin American Development, Democracy, and Social Issues [View project](#)

Generative Design as Tool for Social Innovation: A Methodological Approach

Erika Cortés

Universidad Nacional Autónoma de México

Aura Cruz

Universidad Nacional Autónoma de México

Social innovation / Wicked problems / Design research / Generative capacity / Know-how

There are, at least, two proposals named as “generative design”. Based on a theoretical-methodological proposal, that starts from the morphological processes in design as a fundamental unit of study, which usually is synthesized in a set of detailed instructions to determine the design form and ends at an unpredictable result (CASONATO, 2012), depending on the context it can be: 1. A morphogenetic process that uses structured algorithms as non-linear systems that seek endless, unique and unrepeatable results generated by a code as in nature (SODDU, 1994 in AGKATHIDIS, 2015), or 2. A process of design driven by geometry. However, this research is committed to a completely different concept of generative design. The proposal that we intend to work has as a fundamental category agents that produce design. Our focus is not on giving shape to the design product, but on a theoretical starting point that allows the collective, inclusive and horizontal creation, a “rhizomatic” approach (DELEUZE and GUATTARI, 1980). We will explore the concept of generative design from a perspective which includes all the stakeholders involved in the development of artifacts and interactions, in order to support or improve their ability to “generate”.

Problem Definition

In an increasingly complex context, we face not only a demand for more specialized knowledge, but also for the ability to respond to the demands of the information society, whose outcomes are the knowledge economy (MANZINI, 2015) and constant change. At the same time, we face a myriad of disparities and social exclusions that urges the incorporation of all society members for a reason of justice. Likewise, the lack of a systemic vision has had repercussions socially, economically, environmentally or culturally resulting in terribly unsustainable ways of life (UNESCO).

Therefore, understanding knowledge as a final body is unproductive and paralyzing, hence we need to conform a nomadic or rhizomatic knowledge (DELEUZE and GUATTARI, 1980). The case of design is not different, as a disciplinary practice requires addressing the contingency and recognizing itself as capable of absorbing and incorporating the diverse agents involved in particular problems. Due to the complexity of faced problems, multi-, inter- (MANZINI, 2015) and non-disciplinary teams are required (Diseño Detonante, 2018), we need groups of people with transversal disciplinary skills and, beyond the disciplines, we need extra and multiple skills because it is not only important to empower professionals, but the entire social body to work, listen and learn from each other while considering alternative scenarios as design tasks (MANZINI, 2003).

Lined up as a result, and given the urgent need to conform specific forms of design understood as know-how practices and participating in the complex chain of social innovation processes, we recognize the need that supports our research objective: finding a set of premises for latter creation of a Generative Design methodological approach that allows its theoretical assumptions to take action (MANZINI, 2003).

Conceptual Frame

The current complex world also demands complex answers, which take into account that any proposal is part of a larger system and that it must be elaborated under that assumption. In this sense, as first Rittel and then Richard Buchanan pointed out, every design problem is a “wicked problem” (RITTEL, 1972; BUCHANAN, 1992), this means that any possible solution generates in itself another set of problems due to its complex condition. On the same topic, Alain Findeli argued that design, far from being responsible for solving problems, was in fact responsible for proposing alternative systems to existing ones, each one with its corresponding problems. As well, Ezio Manzini (2003) proposes to conceive such systems or “wicked problems” as possible scenarios presented from their sensorial and sensitive power, that is, an aesthetic one.

Since the matter of design is not reduced to the production of isolated objects, but includes the scenarios that enhance these objects, we also know that, as it has been observed, those scenarios do not involve only things but subjectivities in interaction, that are, socio-biological agents. Therefore, one of the most relevant aspects of this complexity lies in the convergence of social actors around problems, where it is necessary to identify some of their features: on the one hand, generation of alternatives to existing problems demands interdisciplinarity and transdisciplinarity even, but on the other, not only disciplinary agents, whom Manzini calls “expert agents” (2015), need to be incorporated into the

problems, but also the non-specialized ones, whom Manzini calls “diffuse agents”, referring to those who experience the problems and for this reason become a fundamental source for the creation of possible scenarios. One of the platforms that has faced complexity and the challenge of integrating the participation of multiple agents is social innovation.

Social Innovation

Given that complex problems that we face have effects and origins unavoidably in their social and environmental dimensions, a process known as social innovation has been developed to generate effective solutions in support of socio-environmental progress. This process is not the prerogative or privilege of any organizational form or legal structure, but in fact often requires the active collaboration of various actors such as government agents, companies, non-profit organizations and the communities themselves.

To explore the field of social innovation, the theoretical foundation of Manzini helps us to define it as: new ideas (products, services and models) that simultaneously satisfy social needs and create new relationships or social collaborations. That is, existing innovations that are good for society and improve society's action capacity.

The social innovation model (Fig. 1) also requires the definition of a set of conceptual and practical tools, among them design is defined not by its products, but as a way of knowledge applicable to a multiplicity of objects and diverse processes derived from it (MANZINI, 2015). If it is not recognized that design can also be a strategy and, even more, knowledge by its own right, then it can not be imagined that it can play a role in triggering the support and expansion of social innovation.

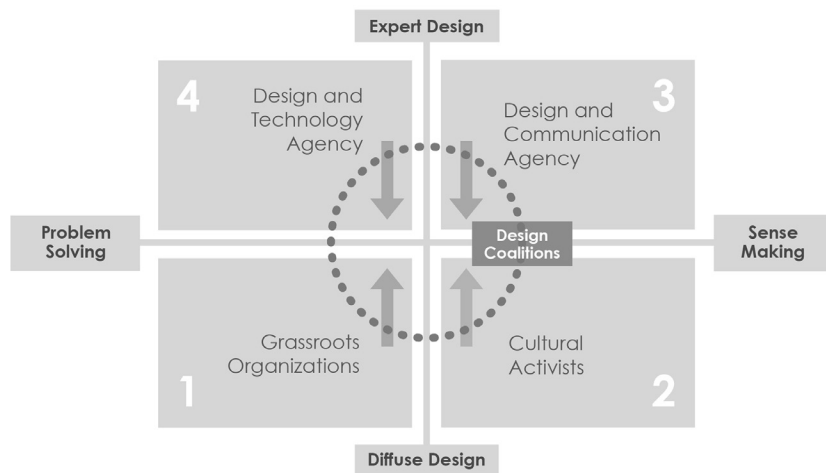


Fig. 1 Design Social Innovation. Source: MANZINI, E. (2015). *Design, When Everybody Designs. An Introduction to Design for Social Innovation*. London, England: The MIT Press Cambridge.

The Role of Design in Social Innovation

In social innovation processes, design will operate as a body of knowledge that will enable strategic actions from its type of consistent *episteme*, according to Manzini, in a systemic vision that involves the creation of scenarios (MANZINI, 2003), or, in agreement with the authors of this document, in the sensitive figuration of alternative worlds: aesthetic imagination, sensitive knowledge.

It should be noted that design for social innovation is not a new discipline, but one of the ways in which contemporary design develops. It becomes evident that an increasing number of people have broken up and are breaking their rou-

tine, and are experimenting with new collaborative ways of living and producing. In a very short time, a growing number of people are promoting a new wave of social innovation.

For centuries, designers have played the role of intruders and managers in the field of design. Today we are in a world where everybody designs and where, as we have seen, our task tends to use our own initiatives to enable groups of social actors to design better (MANZINI, 2015). This change of role has led us to become something different from what we have been up to now, to adapt to what is required, we have redesigned ourselves and our way of operating. This will entail our ability to design in action, understood as: a way of thinking and doing things that leads to reflection and the sense of strategy, calling us to see ourselves and our context, and to act for improving the state of things (MANZINI, 2015).

The role of design in social innovation, within the discipline has been responsible for developing knowledge dedicated to design and on the exterior to redefining the role and perceived capabilities of design. Plotting in time this redefinition of design synthetically, since the social paradigm takes force, it is evident how the inclusion of people has been increasing, which is evidenced in the following events.

- In the 1970s, Participatory Design arises in Scandinavia; it is an exercise that combined the experience of system designers, system researchers and people to increase the value of industrial production, involving workers in the development of a new work system (SANDERS; STAPPERS, 2016).
- At the same time, in the US a movement emerges generated by the interest in urban transformation and the search for citizen participation; it had implications in industry, urban planning and design services (SANOFF, in GARCÉS, 2017).

It is important to note that one of the fundamentals of participatory design since its inception is egalitarianism, where all participants are considered equally in the decision-making process, and it is linked to the process of people empowerment during decision-making, revealing the consequences that these decisions entail at the same time. Promoting a different attitude in people towards their force to change environment conception and management; whose strength lies in being a movement that transgresses traditional professional and cultural boundaries and

boost community participation supported on the idea that the habitat works better if the users (the people) are active and involved in its creation and management instead of being treated as passive consumers (SANOFF, in GARCÉS, 2017).

- During participatory design practice, processes are condensed and the co-design concept emerges. It is important to distinguish that co-creation indicates a collaborative creative effort, regardless of its scale and usually circumscribed in a context; while co-design refers to the co-creation used during a design process, preferably from the beginning to the end, that is to say, this co-creation is focused within the scope of the design (VAN ABEL, et al., 2011).
- Another important movement, of a non-academic nature, within design transition for new purposes, is the “Grass-roots” or social organizations, who give an important value to the wisdom of ordinary people, which is often inaccessible for us, using as a strategy the observation of creative and innovative ways of solving local problems through patient and respectful attention to small details, seeking a deep learning that could occur during surprising moments in the ordinary tasks of daily life.

From Participatory to Generative Design

A “new” transformation movement appears, its genealogical origin is participatory design but it can no longer be named in the same way because of its differences. In this proposal we named it: generative design—Manzini himself has identified it as well. Generative design is a rhizomatic derivation of participatory design, because if rhizomatic organisms grow indefinitely and are also destroyed in their oldest parts (DELEUZE; GUATTARI, 2002), their new developments also result from their ability to adapt to the circumstances. Just that way, it has been happening with the subject that concerns us, the search to generate interactions that seek respect, inclusion, autonomy and collaboration in horizontal social organizations. Participatory design, as a precedent, has left many lessons learned and little by little has evolved to what generative design currently proposes. Today we can infer that the essential difference between participatory and generative design lies fundamentally in the kind of stakeholders intervention. In the first, the designer decides or designs the tool to generate the interaction and the people join based on certain shared knowledge; in generative design it is propitiated that people (expert and diffuse designers, both at the same level of hierarchy) enhance their creativity so that in each case, generate the tools by themselves, detecting the problem and transforming it from a new scenario, or what commonly we call “build the solution” (MANZINI, 2015). Generative design demands the formulation of a methodology but not the creation of tools a priori. In addition, its methodology must be sufficiently open to have derivations of rhizomatic order, which means, adaptable to the circumstances (DELEUZE; GUATTARI, 1980).

To explore the concept of generative design in greater detail, we propose to review Sanders (2006) map of the emerging panorama of design research (Fig. 2) that allows us to locate the influences and surroundings of the different design approaches.

This map is defined and described at the intersection of two dimensions; one of them is the type of approach and the other is the type of mentality. Design research approaches come from a guided/research-led perspective located at the bottom of the map, and from the design-led perspective located at the top of the map. The first perspective has a longer history and has been directed by applied psychology, anthropology, sociology and engineering; it can be associated with scientific knowledge or “pure reason” (KANT, 1787), characterized by the generation of knowledge understood as representation or description of the existing. The second perspective has come into view recently, and is associated with know-how or “practical reason” (KANT, 1788), which is characterized by generating ideas that do not try to represent or describe what exists, but prefigure new possibilities of the world. In the first perspective, knowledge is understood as representation and in the second, as a tool.

On the map also appear two opposing mindsets or ways of thinking that are evident in the practice of design research today. On the left side of the map is described an expert mindset, where people are considered as subjects / users / consumers. On the right side of the map is described a culture characterized by the participatory mindset, where design researchers work with people. People are considered to be the true experts in terms of lived, learned, worked experience. Design researchers with a participatory mindset value people as co-creators in the design process and are so convinced of their inclusion in the design process that they share control with them. For many people it is difficult to move from the left to the right side of the map (or vice versa) since this change requires a significant cultural and political change (SANDERS; STAPPERS, 2016).

The participatory design area expands between the guided/research-led perspective and the design-led perspective, located on the right side of the map. Participatory design is an approach that tries to actively involve people who are part of the process to ensure that products/services are meeting their needs. A characteristic of participatory design is the use of physical artifacts such as tools throughout the process.

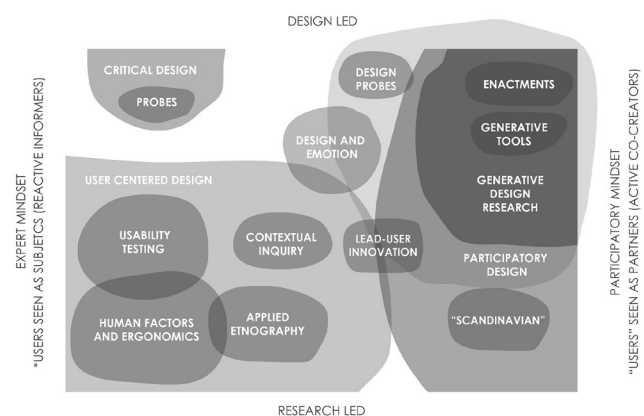


Fig. 2 Emerging panorama of design research. Source: SANDERS, E. B.-N. (2006). “Design research”. *Design Research Quarterly*, No. 1, Design Research Society, September.



The area of generative design is driven by research and fueled by the participatory mindset; generative design empowers people and promotes alternatives to current situations. The concept “generative tools” (SANDERS; STAPPERS, 2016) refers to the creation of a design language shared by designers/researchers and other stakeholders, and used to communicate. Therefore, collaboration tools do not exist a priori, but all the stakeholders are involved in its creation. Design language is generative in the sense that people can express an infinite number of ideas through a limited set of stimuli.

Therefore, the approximation of generative tools is a way to explore ideas, dreams and discoveries [insights] of people that will be served and will take care of themselves through design. This last feature is the point of connection, between the approach of generative design and social innovation, situating design within a horizontal model, it can be achieved that people and designers are “subjects that find themselves at the same level of collaboration and dialogue, in which the two expose their thoughts. As well as the levels of perception about reality and the vision of the world in which they find themselves. Enabling them to work as subjects interested in reflexive action” (FREIRE, in GARCÉS, 2017).

Proposal

We agree on the need to create platforms that meet disciplinary and non-disciplinary design to generate a body of knowledge and fruitful, inclusive and enduring alternatives; we also consider that social innovation is a process where new ideas emerge from a variety of stakeholders directly involved with the problem to be solved: end users, specialists, entrepreneurs, local institutions, organized and unorganized civil society (the “non-experts”). Likewise, not just agents are diverse but also—conscious and unconscious—concepts that guide them in their relationship with the world (NIETZSCHE, 1873); thus, each interaction has a unique power that must be accompanied by methodological approaches that encourage collective creativity and, to that extent, allow specific adaptation to reality specific demands. We need theories and ways of

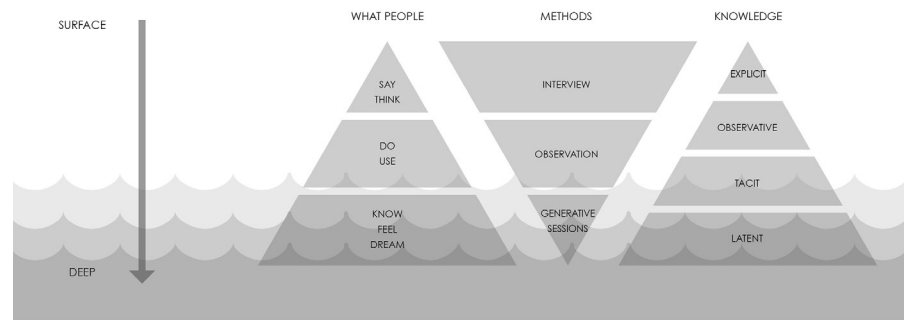


Fig. 3 People, Methods, Knowledge. Source: SANDERS, E. B.-N. (2006). “Design research”. *Design Research Quarterly*, No. 1, Design Research Society, September.

concretizing nomadic or rhizomatic methodologies (DELEUZE and GUATTARI, 1980) supported by versatile tools to create a world that can be discarded, enriched or mutated according to need.

We propose to start from Generative Design, its theoretical understanding, as well as its integration to social innovation with the aim of building a methodological prototype; starting from a selection of social innovation empirical cases, where preexisting concepts have stretched, transformed or even disappeared; all this through a qualitative methodological approach that allows us to obtain the best from selection.

It is necessary to remember that social innovation demands the transition from a linear to a systemic culture; consequently, to make it happen, the flux of resources (people and knowledge) has to be redefined in order to get feedback, so that the output of one activity becomes the input of another. To seek this feedback, this research proposes for the analysis of the case studies to use the scheme (Fig. 3) developed by Sanders (2006), which traces the relationship among people’s behavior, methods and the type of knowledge we can get. In particular, interviews and observation exercises will be performed with organizations that have been involved in social projects, so we can recognize people’s explicit ideas, ways of doing, feeling and imagining within previously identified generative processes.

Methodology

This research was developed through the case study method due to its usefulness in the generation of results that en-

able the growth and development of existing theories or the emergence of new scientific paradigms. From a methodological point of view, the study is empirical, complete and coherent during the different parts of the process. The intimate connection with the reality offered by the application of this method is what makes possible all theoretical development (MARTÍNEZ, 2006).

The selected theoretical sample included cases that can be replicated or extended by the emerging theory (EISENHARDT in MARTÍNEZ, 2006). For this first stage of this research, we analyze the work of:

1. **INFRARURAL**, a social enterprise that aims to develop strategic programs for rural, peri-urban and urban communities with high marginalization and social backwardness, through participatory and inclusive tools, taking advantage of their natural and human resources in order to positively impact on their sustainable community development.
2. **Diseño Detonante**, a group that seeks to generate proposals, from the inter-, trans- and non-disciplinarity to detonate others’ realities in the social and political environment, focused on interactions among oneself, the others and otherness, driven in everyday life, using as resources methods, dialogue and objects that intend to trigger change.

From the qualitative data acquired from various sources, such as interviews and documents related to the cases addressed, we conducted an inductive analysis that revealed us the following insights.

Insights

The fundamental elements to achieve a methodological approach to generative design are:

- At the base, design is always conceived as a tool of change, and considered open, changing and constantly evolving.
- The common purpose is to reduce ignorance and deep indifference towards others; from stimulating the interaction between individuals and realities, which goes from the encounter to the approach, so that people involved can redesign their own structures of thought, imagination and interaction.
- The patterns detected in the projects developed by the selected organizations as case studies.
- They present a clear decision of agency.
- Awareness and training are fundamental activities for the potential of participatory action and to generate ownership in order to achieve success in long-term projects.
- The process includes the design of object-based and methodological tools, developed from the skills and training of involved stakeholders (in the case of Diseño Detonante, they promote the use of media and visual realization).

Conclusions

We believe that daily practices open up different possibilities of interpretation and action for people, where relationships and dispositions are modified with the objects and environments that surround them and that undoubtedly represent time and place outside a pre-established model of use and interpretation; a pause to everything that is functional, orderly, established, universal and quantifiable.

For this research, society became a laboratory, and community organizations enduring witness to the vernacular culture linked to the present and to transformation, where ideas and practices that constitute knowledge constantly emerge. This way of doing, goes beyond the canon and modes of consumption of the economic system in which we live, meaning the inclusion of daily ways of doing and thinking to ideation of design.

Recognizing this kind of design means its democratization, since it also recognizes daily and empirical practices through which people give their own meaning to the world, to things, ideas and actions that are found far from passive consumption, and that prefigure the recognition of knowledge that exceeds disciplinary conception.

Design has opened gaps, and has become a shared informed language among stakeholders involved in projects to develop. For the latter, we must use the joint generative capacity, in order to build and push beyond these languages in common, to increase ownership, cultivate empathy and exterminate indifference among communities.

References

- AGKATHIDIS, A. (2015). *Generative design*. London: Laurence King Publishing Ltd.
- BUCHANAN, R. 1992. *Wicked problems in Design Thinking*. *Design Issues*: Vol. VIII, Number 2, Spring, pp. 5–21, The MIT Press. Retrieved from: <http://www.jstor.org/stable/1511637>
- CASONATO, M. (2012). Ant[i] Design workshop. LCC/MAGD. Retrieved from: https://issuu.com/mxrtinx/docs/2.1_visual_summary_mc
- DELEUZE, G.; GUATTARI, F. (2002). *Mil Mesetas. Capitalismo y Esquizofrenia*. Valencia: Pre-Textos. (1ffi ed. 1988)
- FINDELI, A. (2001). *Rethinking Design Education for the 21st Century: Theoretical, Methodological, and Ethical Discussion*. *Design Issues*: Vol. 17, Number 1, Winter, The MIT Press.
- FRIED, D. (2010). *Procesos generativos en el diálogo: complejidad, emergencia y auto-organización*. En Plumilla Educativa, 61–73. Universidad de Manizales.
- GARCÉS, A. L. (2017). *El diseño en la transmisión de conocimientos tradicionales. Estudio de caso: Pueblo Maya de X-Yatil, Quintana Roo, México*. Tesis de Maestría. Posgrado de Diseño Industrial, UNAM, CDMX.
- GUPTA, A. (2016). *Grassroots Innovation. Minds on the margin are not marginal minds*. Haryana: Random House Publishers India Private Limited.
- KANT, I. (1988). *Crítica de la Razón Pura*. (M. Caimi, Trad.) Madrid: Alfaguara. (Original from 1781).
- (2000). *Crítica de la razón práctica* (R. Aramayo, Trad.) Madrid: Alianza. (Original from 1788).
- MANZINI, E. (2003). “Scenarios of sustainable well-being” in: *Design Philosophy Papers Issues*, no. 1.
- (2015). *Design, When Everybody Designs. An Introduction to Design for Social Innovation*. London: The MIT Press Cambridge.
- MARTÍNEZ, P. (2006) *El método de estudio de caso. Estrategia metodológica de la investigación científica*. *Pensamiento y Gestión*, No. 20: 165–193 ISSN 1657–6276. Universidad del Norte.
- MOULAERT, F., et al. (2005) *Towards Alternative Model(s) of Local Innovation*. *Urban Studies* Vol. 42, No. 11: 1969–1990, October. Routledge – Taylor & Francis Group.
- NIETZSCHE, F. (1996). *Sobre verdad y mentira en sentido extramoral*. Madrid: Editorial Tecnos. (Original from 1873).
- RITTEL, H. (1972). “On the Planning Crisis: System Analysis of the First and Second Generations”, *Bedriftsokonomien*, no. 8: 390–96.
- SANDERS, E. (2006). *Design research. Design Research Quarterly*, No. 1, Design Research Society, September.
- SANDERS, E.; STAPPERS, P. (2016). *Convivial toolbox. Generative research for the front end of design*. Amsterdam: BIS Publishers.
- VAN ABEL., et al. (2011). *Open Design Now. Why design cannot remain exclusive*. The Netherlands: BIS Publishers.

Erika Cortés is professor at the Industrial Design Graduate Program, UNAM. Her academic profile combines architecture, design and urban planning. Her research work explores the connection of design with ethnographic research, social innovation, and creativity.
erika.cortes@gmail.com

Aura Cruz is professor at the Industrial Design Graduate Program UNAM. Formerly an architect, she extended her vision towards a broad idea of design. Her work is allocated primarily on epistemology, theory and history of design.
aura@auracruzaburto.com