

Design: Episteme and Doxa. Co-design as an Opportunity to Share Choices

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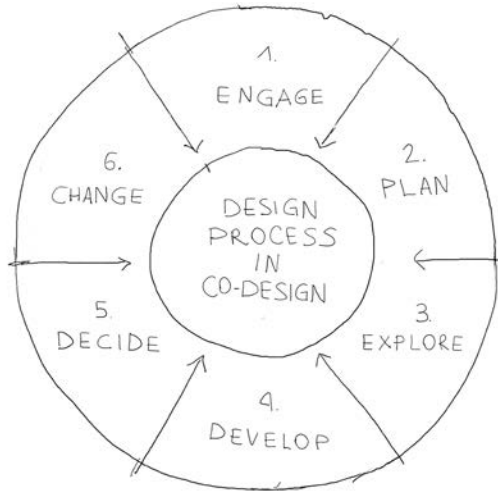
Abstract

This paper delves into the concept of co-design, a collaborative approach involving stakeholders in the conceptualization and design phases to understand diverse perspectives and jointly define project directions. Examining the relationships between co-design, Design Thinking, and user-centred design, the paper emphasises distinctions in their goals and methods. It addresses potential biases in co-design processes, providing strategies to mitigate analogical relations, cognitive effort minimization, and emotional influences. Epistemological reflections highlight the efficacy of participatory methods in generating theoretical hypotheses while underscoring the need for evidence-based validation. The article explores co-design's applications in speculative design and ludo-didactics (game design). In speculative design, co-design aids in framing problems and generating plausible contextualizations, while in game design, participatory processes, particularly playtesting, enhance the exploratory and refinement phases. The paper suggests avenues for further research, emphasising the strategic placement of Co-design processes in project phases, considering potential biases, and exploring its application in disruptive innovation contexts.

Keywords

Co-design
Speculative design
Game design
Participatory design
Design thinking

Co-design, defined as “processes of creative participation” (Steen, 2013) is an approach that includes a group of stakeholders — “any group or individual who can affect or is affected by the achievement of the organisation’s objectives” (Freeman, 1984, p. 49) — during the conceptualization and design phase of a concept, artefact or service with the aim of understanding the needs of each people and jointly defining the direction of a project. The co-design activities are structured in such a way as to transform all the participants into design partners. People with different skills and operational levels will work together. Through a vo-design process they will be able to convey and align their ideas towards a common goal. The aim is that of defining some of the criteria that will affect the future development of the project.



Some Notes on the Origins and the Evolution of Co-design Practices

Fig. 1
Co-design in a schematization by Margherita Febrari.

Co-design is not a new practice: the practices date back to the 1960s when Scandinavian trade unions fought for “cooperative design” (Sandberg, 1979), the right of workers to co-design IT systems that impacted their work (Robertson & Simonsen, 2012).

In particular in Sweden, Norway and Denmark the Collective Resource Approach (Sanders & Stappers, 2008) was defined to improve the profitability of work by improving the workplace through the contribution of the workers themselves.

The same process was taking place simultaneously in other countries, for example in the United Kingdom, where the founding conference *Design Participation* (Cross, 1972) was held. This conference sanctioned the use of the term “participatory design” in the Anglo-Saxon area (Sanders & Stappers, 2008).

The need to engage users in research was earning greater and greater acclaim, both professionally and politically.

The crucial process during this phase was the need to participate not only in the decision-making phases, but also in the development phases of the idea.

At the same time participatory practices became more widespread and were used primarily in urban planning and architecture, where particular mention should be made of Kevin Lynch (2005) and Giancarlo De Carlo (De Carlo, 2013; Marini, 2020).

In the 1980s, the approach was also adopted by other sectors and Donald Norman published his famous book *The Design of Everyday Things* (Norman, 2013) in which he coined the term “user-centred design”. This marked the transition to a design mentality focused on a holistic approach and on human needs, in which practices and knowledge developed in the psychological and ergonomic fields are closely intertwined with design.

Digital and non-digital brands, from Amazon to AirBnb, from Google to Booking, as well as governments such as that of the United Kingdom, invested in user experience design (UX) which also involved the adoption of co-design practices (Lavazza, 2015).

Two polarities are therefore outlined in the user’s involvement in the design process, and illustrated in the scheme proposed by Sanders & Stappers (2008): one in which the user is involved as a partner and one in which the user becomes the subject of an experiment.

The concept of co-design therefore interacts with the concepts, subsequently developed, of user-centred design, of Design Thinking and of other approaches that go beyond the anthropocentric model.

The terms design thinking, co-design and user-centred design are used interchangeably in some literature. “Design thinking is a problem-solving approach which reduces a number of broad design methods into a simple replicable framework, and it is utilised in an ever-increasing number of settings to address a growing variety of challenges” (Baker III & Moukhliiss, 2020, p.). On the contrary, user-centred design is a design philosophy and a process in which the user’s needs, desires and limitations with respect to the final product are given great attention at every step of the design process to maximise the usability of the product itself.

It is also evident that “The main findings are that although Design Thinking is a widely known concept[,] an approach for a structured development of new solutions a clear definition and approach is missing” (Baker III & Moukhliiss, 2020, p.).

Many definitions in the literature emphasise that in Design Thinking the user’s needs are at the centre of the process, but the focus is more on the elaboration of replicable frameworks and on the processes to generate innovative solutions (Schallmo et al., 2018), rather than on the usability of the product.

In these terms, co-design is therefore similar to design thinking as it aims to generate solutions through a series of activities involving a group, but while design thinking aims (or aimed) to develop an easily repeatable framework for the generation of innovative ideas (Baker III & Moukhliiss, 2020), co-design aims to identify the widest variety of stakeholder involvement strategies in the project and for this reason it can also take on a more political connotation. In this sense they are distinct areas although the methods they use may be similar or even the same.

Furthermore, design thinking is also widely used in areas not strictly related to design — such as management — for the easy

applicability of more formal methods in groups of novices and for its effectiveness when combined with more reflective methods in the “concept generation” phase (Seidel & Fixson, 2013).

In more recent times we are witnessing a shift of attention from design as problem solving to design as a hypothesis generator (Dunne & Raby, 2013). In this context co-design and design thinking can be seen as converging.

This paper aims to explore and define some hypotheses on the role of co-design and to set the bases of future research.

- *Effectiveness of co-design and its positioning in the design process.* The first hypothesis is that co-design is an effective approach for addressing diverse perspectives, understanding stakeholders’ needs, and collaboratively defining project directions, but not for consolidating hypotheses. The effectiveness of co-design is influenced by its strategic placement in different phases of a project, considering the nature of biases and project requirements.
- *Biases in co-design processes.* The second hypothesis is that co-design processes may be susceptible to biases, such as analogical relations, cognitive effort minimization, and emotional influences. We hypothesise that these biases can be mitigated through specific strategies.
- *Application of co-design in different design areas.* The third hypothesis is that co-design can be successfully applied in various design domains, such as speculative design and ludo-didactics, with potential benefits for framing problems, generating contextualization, and enhancing exploratory and refinement phases.

The Role and the Limits of Co-design

The processes of Co-design take place mainly in the form of workshops in an informal environment. With the help of one or more facilitators, participants compare and explore ideas through a series of working methods, with varying degrees of formalisation, across different fields. The corpus of these activities is not strictly defined.

It is important to define and clarify the objective of the co-design session before beginning to facilitate the understanding of the exercises, to be able to guide participants in the co-creation process and evaluate the results.

These practices are part of a widely variegated corpus. In general it may be observed that the methods used (for example from Lynch’s interviews (Lynch, 2005) to gamestorming (Gray et al., 2010)) are predominantly qualitative. They are methods derived from the social sciences (for example participant observation or semi-structured interviews) or from marketing (for example focus groups). These methods are adapted to the task of bringing out latent problems, generating or selecting innovative concepts and, more generally, formulating “futuristic” hypotheses, instead of photographing a particular situation or evaluating the perception of a particular artefact. Thus they respond more specifically to the objectives of design than those of sociological or market research.

Given that any type of stakeholder involvement in a design process reduces the biases compared to an authorial project, the risks of bias in an approach that relies on qualitative methods alone remain, in particular bias related to social desirability or to the selection of the sample.

In the existing literature, we identified, among other, three features common to the biases that influence a co-design process. These features are often found together:

- Biases whose error lies in considering an analogical relation between two domains (and thus, incomplete) as an isomorphism. This can be due to: (1) a mistaken perception of a domain or a single case, as representative of a larger set or (2) a wrong link between two phenomena, which are actually distinct and only apparently connected (e.g. Clustering illusion (Calero Valdez et al., 2018), Rosy retrospection bias (Mitchell & Thompson, 1994), Apophenia (Ellerby & Tunney, 2017), etc.);
- Biases related to the minimization of cognitive effort (Gonzalez et al., 2005) and therefore to the simplification and reduction of the variables involved and the underestimation of some factors (e.g. Ambiguity effect, Attribute substitution (Kahneman & Frederick, 2002), Dunning-Kruger effect (Kruger & Dunning, 1999), Base rate fallacy (Bar-Hillel, 1980), etc.);
- Biases related to emotional aspects or to the particular conditions of the participants (e.g. IKEA effect (Norton et al., 2012), NIH effect (Not invented here effect), Subjective validation bias, etc.).

Given the knowledge of perceptual and cognitive biases, each co-design protocol provides, or should include, solutions to reduce bias (Cassotti et al., 2012), for example through the introduction of external observers or forms of redundancy - such as, for example, repeating co-design activities with groups profiled in the same way, but made up of different people.

In order to limit perceptual distortions it is useful to complete the observations by carrying out experimental psychometric quantitative investigations on the hypotheses (concept or choice hypotheses) (Perondi & Costa, 2020) and to introduce the concept of triangulation in the practices of co-design (Modell, 2005), that is, combining qualitative and quantitative methods and increasing redundancy in observations.

On the one hand, the investigation conducted through participatory processes allows for a depth and breadth unattainable through a more reductionist approach, on the other, the quantitative investigations allow for a corroboration of the hypotheses developed in participatory processes.

Epistemological Reflections on the Co-design Approach

Processes that have a structure based on participatory methods — which include the “research through design” approach — are extremely effective in generating theoretical hypotheses (Zimmerman et al., 2010), but not in founding scientific theories, as they are missing evidence-based validation processes. Therefore, the action

which encompasses much of speculative design and of the design process in general and which Dunne & Raby (2013) define with the term “to probe possible futures” is necessary, but these futures must be put to the test of the facts. In this way, the co-design approach does not refrain from probing scenarios, but at the same time has the opportunity to find usable knowledge. It is therefore possible to correct the bias factors implicit in participatory processes.

Application of Co-design

Co-design allows us to frame the problems from another point of view: that of the people who will use the product, but also of those who will work behind the scenes and the people who have commissioned it or are committed to designing it.

Co-design aims at solving the problem together with the patient.

It is necessary to consider that co-design processes also have a political intent, that is to create a consensus around the project, which in this way is felt by the stakeholders as ‘their own’, exploiting the aforementioned IKEA effect (Norton et al., 2012).

Observing the co-design processes in the afore-mentioned literature, it is noted that participation is mainly involved in some aspects of the design: in the definition of the problems, the elaboration and the validation of the concepts in particular, in certain aspects of the generation of ideas and scenarios and the selection of the concepts, little or not at all in the technical elaboration of the project and not at all in the organisation and preparation of the co-design activities themselves. The role of people who guide a process and that of people with strong technical skills and experience who lead the process of generating ideas and formulating hypotheses is evident and inevitable.

The possibilities of enacting a co-design process vary in relation to the project area: the more technical expertise is required to develop ideas, the less possible it is to activate a co-design process.

We will try to propose two areas of design activities that in our opinion well illustrate the potential, role and limits of co-design.

The areas we have chosen are speculative design and ludo-didactics (and more in general game design). We have chosen these themes because the authors of this article have tried to apply the methods of co-design in these sectors and they demonstrate the potential and limits of a participatory approach.

Speculative Design

The practice of speculative design is part of the methodology of critical design (Dunne & Raby, 2013) and therefore presents itself as a form of problem-setting rather than problem-solving method, as Galloway & Dunlop (2007) states, highlighting that the role of Design is to foster debates, and noting that the best chance for a critical intervention lies in taking an active part in dealing with shared issues, even if this may mean not solving the problems.

Like any design practice, even speculative design has useful tools for developing the different phases of the process. They can be divided into various categories, depending on the purpose they serve in the Design process. There are research and analysis tools, such as online platforms that collect and describe global trends in the present and project consistently in the future, used to construct scenarios; other research tools can be platforms for sharing scientific knowledge, such as Google Scholar or Science Direct, which makes information about research, in progress or completed, available to the public, and useful in providing truth about what designers want to design, and finally interviews and focus groups with participants belonging to the areas of knowledge involved in the project.

There are meta-design tools, used for the construction of scenarios (Schultz et al., 2012), contexts, users, needs and future problems, such as polar graphs and 4 or 6-axis matrices, which can define and explore all the elements necessary to generate a plausible contextualization.

Because of the themes it deals with, Speculative Design is applied primarily in exhibition circuits, and discussed in conferences and conventions. For this reason, storytelling and Design fiction (Bleecker, 2009) are the tools most frequently used to make the designed content available to the public. Design fiction is a design practice aimed at exploring and criticising possible futures by creating provocative scenarios, narrated using design tools. It is a way to facilitate and foster debates.

Among the techniques used to support the narration, as anticipated in the previous paragraphs, there is the creation of physical artefacts through rapid prototyping and communicative artefacts that can range from simple images to videos, more or less complex and articulated, and infographics (Davies & Sarpong, 2013).

Game Design

Game design — particularly in an educational context — implies processes of participation, at least to verify the game mechanics. Playtesting practices have long been included and well-described in manuals (Fullerton et al., 2004; Schell, 2008; Tekinbaş & Zimmerman, 2003), not limited to the pre-release phases.

In game design, the organisational phase and the prototype elaboration phase, functional to the design process, largely exclude the stakeholders. In the other phases the involvement of users in the design processes is crucial, although an experience in game design is crucial for the success of the game and for the co-design sessions themselves.

Playtesting practices show similarities for the design of digital games, serious games, didactic games and board games. Even though the differences between the areas are substantial, the mechanics and some playtesting modes are similar and in this context we can consider the specific literature of these coveted areas, because we are specifically interested in co-design processes, rather than game design itself.

Effective playtesting requires clear operationalization to obtain information defined by the playtesting experience and transform it into project progress (Choi et al., 2016).

In Game User Research, there are defined variables that are used to evaluate the gaming experience and its effects, measured both subjectively and objectively (Boyle et al., 2016), and the methods of measurement, and are in turn combined into sets of more heuristic complexes such as RITE and PLAY (Choi et al., 2016).

As may be seen from the reported literature, playtesting contains, among others, activities that serve to explore and refine the games, which present iterative working methods similar to co-design processes.

Observation shows that the exploration and refinement phases are enhanced by participatory processes.

Conclusions

In a context of disruptive innovation, Design acquires new roles which place it in a different position compared to the practices of the 2010s.

Design Thinking increases the ability of companies to make effective and profitable decisions, leveraging the involvement of various internal and external stakeholders. It does so by enabling teams to develop creative thinking through the work of very cohesive and determined teams, in which the vision of the problems is combined with the identification of potential innovative solutions.

Speculative Design underlines the importance of designing futuristic scenarios, users and artefacts, starting from the phenomena and innovations that take place in the present, with the aim of feeding critical and shared thinking first and foremost through a relationship with 'people' who are involved directly or indirectly.

At the same time, all these methods must be consciously introduced into the ideation and design process, as they are subject to potential cognitive biases, which can be compensated with a process of triangulation. Further research should be conducted on this subject.

Furthermore, the co-design processes must be correctly placed within the phases of the project with the greatest potential and most compatible with a participatory approach. In particular in the phases of exploration and refinement, and when less technical skills or the need for highly inductive processes are required, possibly integrating these phases with automation and neural network models (Lin et al., 2010).

Suggestions for Further Research

The aforementioned purposes and objectives provide the opportunity to address a particularly topical issue, the theme of the Post Human, of the possible evolutions of mankind. How are these evolutions influenced by technologies that are becoming more and more pervasive and efficient? How are mega-trends increasingly oriented towards changing lifestyles, as regards the relationships between human beings, the environment and the system of artefacts?

Ultimately, and in combination with what has been written previously, the practice of transition and speculative design could deepen and transform the relationship with the world of scientific

and social disciplines: for the natural and social sciences, design could become a tool for communicating innovations, discoveries and progress and, therefore, a tool for interfacing with a less aware public, with users or, more accurately, people. For design, they would become basins from which to draw to find stimuli, just as technology and the industrial world are and have been, favouring a thriving territory of relationship (Bisson et al., 2020).

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