A Futures-Design-Process Model for Participatory Futures

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Abstract

This paper presents a way of merging approaches of participatory futures research with the structures of Research through Design, to apply processes and methods from design in scientific research. It offers a systematic model to integrate the communication process used in human-centered design (i.e. the Generic Design Process) with concepts found in participatory normative futures studies and foresight practices. It is based on the understanding that design and foresight methodology have been converging for some time now, and acknowledges the branch in futures studies that has been employing creative approaches often to work on societal issues. This "Futures-Design-Process model" wants to offer a structure mainly for participatory futures research, towards generating knowledge as well as action to shape a more sustainable future.

Keywords: Alternative Futures, Design Process, Futures Research Design, Participatory Futures, Research Through Design.

As a communication designer, futurist, and researcher my quest is to merge the scientific aspects of analysis and reflection with the momentum of the inspirational and creative facets of designerly knowing (Cross, 2006). When introduced to the theoretical debate on the paradigms of futures studies, the exploration of future developments often seem to involve normative participatory formats to discover the different images and concepts that stakeholders have (Bishop & Hines, 2013; Inayatullah, 2008; Kreibich, Oertel, & Wölk, 2011). The German futurist Rolf Kreibich defines the field as follows: "Futures studies are the *scientific* study of possible, desirable, and probable future developments and scope for design, as well as the conditions for these in the past and in the present. Modern futures studies assume that the future is not entirely determinable and that different future developments (futures) are possible and there is scope for design." (Kreibich et al., 2011, p. 8, emphasis added)

The interdisciplinary field of futures studies intersects with the humanities, natural sciences, politics, and more recently, on a conceptual and methodological level, with design (Candy, 2010; Candy & Dunagan, 2017; Hines & Zindato, 2016; Kelliher & Byrne, 2015; Ollenburg, 2018). For example, in 2012 Arizona State University hosted "Emerge: Artists and Scientists Redesign the Future". It had the aim to "... purposefully unite[] artists, designers, social scientists, futurists and engineers in an integrated series of foresight workshops

and activities" (Kelliher & Byrne, 2015, p.36). A more recent event was the "Design Develop Transform Conference" in Brussels and Antwerp in June 2017, hosted by the department of Applied Futures Research of the Erasmus University College Brussels and the Museum of Contemporary Art Antwerp. At this three-day event, contributors from all over the world presented their theories and approaches, often combining futures research, design and creative methods. In recent years design schools have understood that the act of design is planning and creating for a future, and started offering graduate studies in the field of futures studies and foresight practices, at OCAD University[1], California College of the Arts[2], and Potsdam University of Applied Sciences (FH;P)[3] among others (Candy & Dunagan, 2017, p.138; Ollenburg, 2018).

Already in the 1960s and 1970s approaches were developed to combine the anticipatory with the creative, of which Robert Jungk's and Norbert Müllert's Future Workshop methodology is an example. It was meant to encourage and empower participants to design their own future (Kuhnt & Müllert, 2006). Throughout the three phases of *critique* (critiquing the present situation) *utopia* (imagining the desired), and realization (setting up plans to implement), creative methods are applied to inspire and aid participants to visualize and think outside the box. Following suit are processes such as Action Research (Ramos, 2017) where stakeholders participate in research to actively find solutions to their issues. Such approaches have been criticized in some quarters as failing the requirement of scientific standards, and so rather work as consulting tools (Popp, 2013).

Nonetheless the breadth of work by futurists and designers, exploring ways to combine their fields and methods, has been growing rapidly (Candy & Dunagan, 2017; Hines & Zindato, 2016). This paper acknowledges their pioneering work (the present double issue of the *Journal of Futures Studies* on Design and Futures is itself a witness to this development). The combination seems a natural fit as both design and futures studies work with aspects of the future. Yet design often concentrates on the tangible, and futures studies on the imaginable and strategic (Candy, 2010; Hines & Zindato, 2016; Ollenburg, 2018).

Frameworks to combine the two – especially design methods and participatory formats –have been proven to work in transformative processes (Candy & Kornet, 2019; Ramos, 2013). Yet the question remains; is there a structure that can systematically enclose the concepts and methods derived from futures studies, utilize the inspirational momentum of design, and measure up to scientific standards of reproducibility and transparency?

In strategic foresight, Joseph Voros suggests the "Generic Foresight Framework" (Voros, 2003). As a structure that is clear, transparent, and linear, it could be said to meet scientific research standards – where process, distinct methodology, as well as the objective of each phase, support the evaluation of results and help to define the researcher's role. Voros' framework consists of the following phases: Inputs: look and see what's happening → Analysis: what seems to be happening? → Interpretation: what's really happening? → Prospection: what might happen? → Outputs: what might we need to do? And finally, Strategy: what will we do? / how will we do it?" (Voros, 2003, p. 11). If creative and design elements were added, at first sight this may seem a viable option for combining foresight and design in a structure for research projects. Yet it lacks the human-centered attitude that is inherent in the design process.

Searching further in the field of design methods, I came across the design theorist Wolfgang Jonas, who has examined design, its methods and process since the 1990s. He proposes a three-phase model as a communicative and iterative design process, consisting of Analysis, Projection, and Synthesis (Jonas, 1997, p.12). He finds parallels between scenario planning and designing, with the latter being a pragmatic aspect of futures studies (p.13-19).

Therefore, this paper explores the proposal for a "Generic Design Process" used in "Research through Design" (RtD) (Hugentobler, Jonas, & Rahe, 2004; Jonas, 2007) as a foundation for futures research that would integrate participatory foresight approaches without compromising the transparency and comprehension requirements of scientific studies. Its objective is to merge these

requirements with design's inspirational and practical facets, to open up the possibilities of making future developments into tangible experiences.

Participatory Futures Research

In futures studies it is generally agreed that the *future* as a temporal phenomenon does not exist, is uncertain, and in this sense, that *the future* in itself cannot be an object of research. People do however envision futures and have their own images of them (Candy & Dunagan, 2017; Grunwald, 2014; Inayatullah, 2008). The concept of *future* can be an empty canvas, inspiring us to fill it with our hopes and fears, and due to ecological, economic and social challenges, the interest in getting more defined ideas on future developments is increasing. But in scholarly futures studies, an exclusively predictive orientation is widely seen as outmoded (Gidley, 2017; Ramos, 2017). Projects that deal with current and future challenges relevant to the public often actively involve stakeholders, addressees, as well as experts of a field. Participatory formats encourage the sharing of images, ideas, and concepts about the future to obtain a wide range of perspectives on possible developments (Hayward & Hines, 2012; Kreibich et al., 2011).

This participatory futures studies approach can be traced in part to roots in Germany in the late 1960s, in the epistemology of Critical Theory, with the aim of empowering the human being to shape their own future. Robert Jungk's Future Workshop comes from that era. Historian Elke Seefried calls this strand within the field "critical and emancipatory" (Seefried, 2014, pp.12-13). Further, the aim to involve and empower stakeholders in shaping their future is found in such methodologies as Action Research, where scientific research combines with practice-orientation towards social transformation (Gidley, 2017; Kreibich et al., 2011; Popp, 2013; Ramos, 2017). "[Participatory futures] facilitates empowerment and transformation through engagement and participation. Researchers have found that being able to participate in how the future is constructed by the powers-that-be is an empowering process" (Gidley, 2017, p.70).

To effectively engage stakeholders in envisioning their futures, and to encourage change, futurists have elaborated diverse methods and structures. Most include learning as the key to transformation (Dator, 2009; Inayatullah, 2008). The structure of "Anticipatory Action Learning" (AAL) is just one example that fuses participatory approaches and futures studies, and opens "a transformational space of inquiry, the long-term and planetary future, with the everyday and embodied world of relating and acting" (Ramos, 2017, p.830). Another is Inayatullah's "Six Pillars of Futures Studies", consisting of Mapping, Anticipating, Timing, Deepening, Creating Alternatives, and Transforming (Inayatullah, 2008; Ramos, 2017). Along similar lines is José Ramos' "Futures Action Model" (FAM). Its nested structure aims towards a problem-solution sequence based on the sociological method of Action Research, and it combines the participatory approach with futures research methodology. It starts with issues of global relevance to trickle down to "a solution space where participants can explore the purpose, resource strategy, and governance system of an initiative that can effectively address the issue or problem" (Ramos, 2017, p.837).

Participatory futures research is a normative and dialogical process in search of social transformation. Its objective is to interactively explore present images, ideas, and concepts of the future. It may want to deconstruct current concepts to give space to innovative ideas and encourage alternative paths (Dator, 2009; Inayatullah, 2008; Kreibich et al., 2011; Ramos, 2017). In research with participatory claims, a researcher holds a dual role: first, to explore and analyze, and second (for example in stakeholder-workshop formats), to become a facilitator for change. Under such circumstances, upholding scientific standards can become a dilemma: when and how to play the researcher, whose task is to keep track of and scrutinize data outside the normative influence of participants with their cultural structures, social patterns, and behaviors, and when to play the facilitator, whose task is to initiate transformation (Popp, 2013). The availability of a framework to

structure and divide the research design might aid the researcher/facilitator in managing these roles. It may perhaps make the process more transparent and reproducible, supporting the evaluation of results.

Research Through Design

To design is to plan, create, and initiate change, and includes communicating with the user / stakeholders for whom an artifact is created. Therefore, to design is part of a communication process (Krippendorff, 2006, p.149). Even in a "technology-driven design", the communication is from the designer who produced the artifact as the "expert for the layman". Such "monological" communication can be called "first-order-understanding" (Krippendorff, 2006, pp.67-68). In contrast, but similar to the participatory futures approaches, in a "human-centered design process" the designer involves stakeholders. With this "dialogical" attitude there is space to exchange ideas and find acceptable compromises. As a communication process it extends beyond words where the designer appreciates the "network of stakeholders" (versus a "voiceless user") and with them explores their needs and preferences[4] (pp. 64-65). "Understanding someone else's understanding is an understanding of understanding, an understanding that recursively embeds another person's understanding in one's own, even if, and particularly when, these understandings disagree, contradict one another or are thought by one to be wrong or appallingly unethical. This recursive understanding of understanding is a *second-order understanding*" (Krippendorff, 2006, p.66).

To have an encompassing understanding of the stakeholder's perspective, the human-centered-design-process combined with the designer's way of knowing (i.e. process of trial and error as well as exploring options) is a type of design research (Cross, 2006, pp.29-34). Here design methods are combined with adaptations of methodologies from the social sciences, humanities, and the like (interviews, personas, customer journeys, cultural probes and more). They help make intangible ideas and concepts tangible: "Design research is a systematic search for, and acquisition of knowledge related to general human ecology considered from a designerly way of thinking, i.e. a project-oriented perspective" (Findeli, 2010, p.294).

Such dialogical design processes can be applied towards research *for* design, or *in* design, but also, as design theorist Christopher Frayling calls it, "Research *through* Design" (RtD). This means that the designer's own instruments and methods are used to produce new information. Part of the research process is to create and work with tangibles and artifacts. This experience becomes relevant for theory-building as well as practice (Jonas, 2015b, p.34). It refers to research adapting a design process, designerly thinking, to acquire results and generate knowledge. "Design[erly] thinking is in many ways the obverse of scientific thinking. Where the scientist sifts facts to discover patterns and insights, the designer invents new patterns and concepts to address facts and possibilities" (Owen, 2007, p.17).

Similar to participatory futures research, the results of RtD often go beyond solving problems. In RtD the interaction can encompass unexpected discoveries and innovations. The critique of RtD is that scientific standards such as verifiability may not apply, and that the process may be too intuitive and insufficiently transparent, and therefore not reproducible (Jonas, 2015a, p.114) As an answer, the "Generic Design Process model" (Figure 1) seeks to accommodate designerly thinking and scientific standards as an RtD process (Jonas, 2007, 2015a, 2015b). It is based on an iterative learning cycle for generating knowledge and reflecting on the outcome, and it is driven by communication; within a team; with stakeholders; with anyone or anything involved. It consists of a macro-process of three phases; Analysis, Projection, and Synthesis (APS/PAS). Each phase instigates a micro-process resembling Kolb's Learning Cycle containing the stages of: Observation (research), Reflection (analysis), Decision-making (synthesis) and Action (realization).
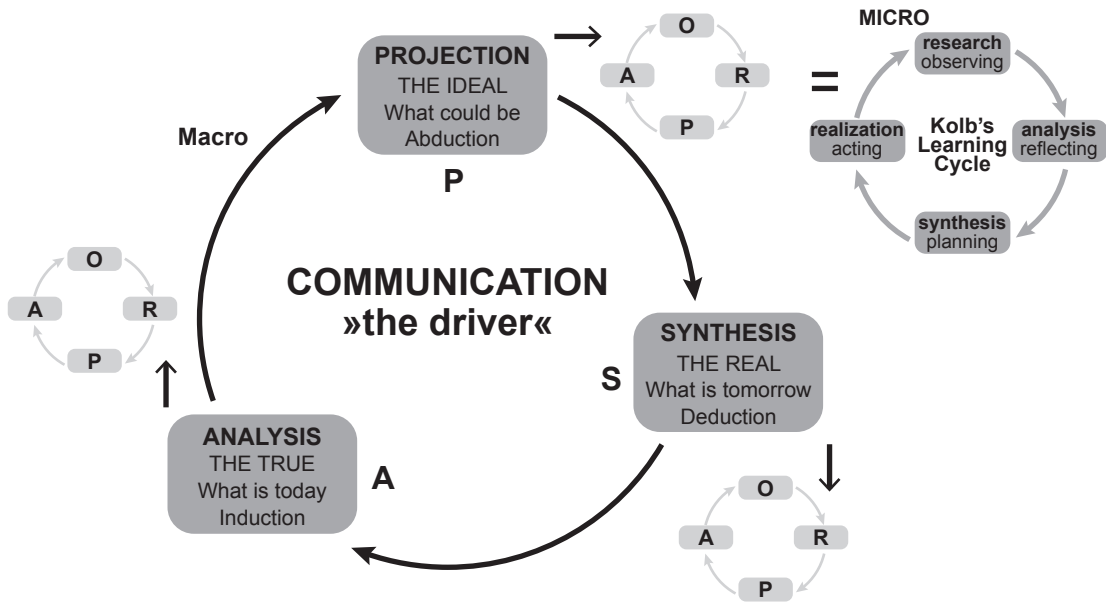
Figure 1. Combing the APS design process (macro) with Kolb's learning cycle (micro) becomes a generic hypercyclic model of design process i.e. the "Generic Design Process" model (rendering by author, Ollenburg, based on Hugentobler et al., 2004, p.7; Jonas, 2007, p.1375)

The phases in the macro-process generate knowledge from different points of view using[5]:
(1) Analysis: "The True – What is?" The facts are studied through *induction*; a general rule is derived from a specific observation of the existing: "How is it today?"
(2) Projection: "The Ideal – What could be?" Beliefs and values are considered through *abduction;* combining observation with intuition to create new insights and ideas: "How could it be?"
(3) Synthesis: "The Real – What shall be?" Findings of the previous phases are combined to establish the possibility of realization. The deduction results in possible ramifications of the previous knowledge: "How is it tomorrow?" (Jonas & Chow, 2008, pp.2-5)

Furthermore, a "Toolbox" (Figure 2) of key-questions for each phase and stage helps the user to plan and reflect on the needed steps without being overly rigid. The starting phase can be handled flexibly. By beginning with Analysis, it will be more of a problem-driven process, whereas putting the Projection phase first (ideation), the process becomes more solution-driven (Jonas & Chow, 2010, p.5). As part of the mindset of designerly thinking, the process allows trial and error in the recurring learning cycles. Therefore, knowledge for transformation of a given issue is generated in the communication process of a human-centered design approach: "[It] implies a transformation from *professional problem-solving* expertise to *participative projects*, directed by designers, and finally towards *collaborative/collective/communicative action*, possibly facilitated by designers. We face the basic problems of control, due to systemic complexity, and of *prediction*, due to future uncertainty" (Jonas, 2015a, p.127).

		Domains of design inquiry, steps / components of the iterative macro process of designing			
		ANALYSIS "The True" how it is today	**PROJECTION** "The Ideal" how it could be	**SYNTHESIS** "The Real" how it is tomorrow	**COMMUNICATION** "The Driver"
Steps of the iterative micro process of learning / designing	**research** observing	How to get data on the situation as it IS? → **data on what IS**	How to get data on future changes? → **future-related data**	How to get data on the situation as it SHALL BE → **problem data**	How to establish the process and move it forward? How to enable positive team dynamics? How to find balance between action/ reflection? How to build hot teams? How to enable equal participation? → **focused and efficient teamwork**
	analysis reflecting	How to make sense of this data? → knowledge **of what IS**	How to interpret these data? → **information about futures**	How to evaluate these data? → **problem, list of requirements**	
	synthesis planning	How to under-stand the situation as a whole? → **worldviews**	How to get consistent images of possible futures? → **scenarios**	How to design solutions of the problem? → **design solutions**	
	realization acting	How to present the situation as IS? → **consent on the situation**	How to present the future scenarios? → **consent on problems / goals**	How to present the solutions? → **decisions ab "go / no go"**	

Figure 2. The hypercyclic process, linearized into a "Toolbox": categories of innovation and design methods and tools, questions and results. Source: (Jonas & Chow, 2008, p.3)

A Discussion: A model of Collaboration

The following proposes a synergy of RtD's Generic Design Process (GDP) and the concept of alternative futures to enhance participatory futures research by separating scientific research steps and participatory formats: APS/PAS Futures-Design-Process model (Figure 3)

The GDP builds the foundation as a transparent and cohesive structure. The setup of the three phases, including the micro-cycle (Kolb's Learning Cycle), is meant to encourage designerly knowing and thinking through the stages of being inspired, through observation in combination with reflection, to finally plan and focus on creating tangibles. The GDP is enhanced with the futures studies concept of multiple or alternative futures. Each phase may focus separately on either the analytical-exploratory mode of considering probable and possible futures or the imaginary-normative mode of (un-)desirable or (not-)preferable futures. Such separation in the Analysis and Projection phases aims to give each perspective its own due space. In the end, either way they are compiled in the third phase, Synthesis, as inspiration for plausible futures with the potential of implementation.

The model is based on the premise of multiple perspectives, and in this it is similar to AAL and FAM. By having stakeholders experience, to learn and understand different viewpoints, knowledge is generated to inspire action for transformation. The "Futures-Design-Process model" (F-D-P) works as an iterative discursive participatory research process, using existing exploratory and analytical futures methods (e.g. Delphi, Futures Wheel) as well as established creative and design-

led methods (e.g. visualization, storytelling). The questions used in the GDP Toolbox (Figure 2) can be adapted to become a guide for choosing foresight, design, or creative methods and tools at each step of the process.
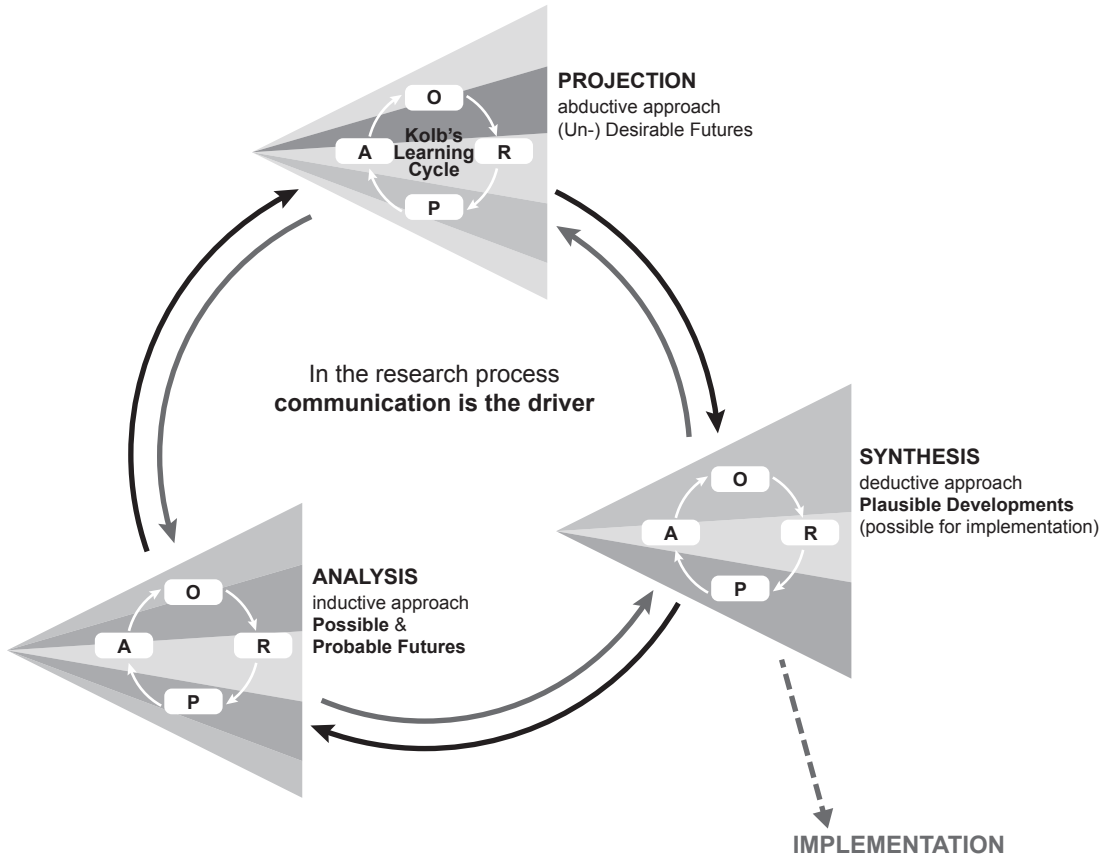

Figure 3. A hypothetical research approach: APS/PAS Futures-Design-Process model (by author: Ollenburg)

Following is an overview of the three phases in the F-D-P. As mentioned above, each includes the stages of Kolb's Learning Cycle:

- **Analysis:** The question is *What can be/ What is probable/possible?* The approach is inductive, and includes an in-depth examination of the subject matter – similar to Input and Analysis in Voros' Generic Foresight Framework (2003). Here research will focus on the "given" to find general trajectories, e.g., the observation and analysis of trends and weak signals, as well as interviews or questionnaires among experts or other stakeholders to outline possible and probable future developments.
- **Projection:** The question is *What should be or not be/ What is the (un-)desirable?* The approach is abductive, and may include use of creative methods to derive the unexpected. In a participatory workshop format, it first reveals the existing future images of stakeholders, aiming then to inspire and arrive at speculative assumptions, and identify desirable and undesirable future developments.
- **Synthesis:** The question is *What could be? / What are plausible developments?* The approach is deductive, that is, developing ideas uncovered through the previous phases. The information and knowledge gained by the researcher and participating stakeholders flows into their suggestions for potential prototypes. The aim is to let stakeholders experience the future developments in

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more vivid forms, for example as an artifact or a narrative. These tangibles may then serve as the basis for the next iteration.

The phases introduced each have a different objective and can be a guide for choosing methods to fulfil the task of the research project, especially in a longer-term assignment. There are parallels here to Ethnographic Experiential Futures (EXF) framework and its phases Map → Multiply → Mediate → Mount → Map (Candy & Kornet, 2019). The F-D-P model is distinguished by the detailed structure of its macro- and micro-cycles. Holding to these steps can support the researcher's goal of reproducibility, and help participants follow the process in each phase. As a participatory framework it encourages facilitators to use methods from design and to visualize ideas, tell stories, generate "artifacts from the future", or similar. On the other hand, methods to support the analytical phase can be more of a scientific and exploratory nature, such as a Delphi survey, trend-scouting and the like.

So far the F-D-P model has been applied in an educational setting. It has served as a framework for students of architecture to experience and work with alternative futures (Ollenburg, 2018), but it would be conceivable to apply to research projects in other settings, for instance, urban planning concerning mobility questions. In such a case, a city council may need to accommodate the inhabitants and businesses of the city and its surrounding area, as well as environmental issues. Applying the F-D-P model, a first step could be to undertake Analysis with experts and stakeholders of present plans to generate probable scenarios for infrastructure development. Then in the Projection phase, in a workshop format, stakeholders could ideate on how their (utopian or dystopian) future city looks, feels and sounds. The results of both phases would need to be evaluated according to their possibility of realization, as well as their preferability among stakeholders. Then there would be a Synthesis phase, carried out by building and experiencing prototypes for their transportation needs.

The key hurdles in such a research design may be less in the defined plan or the various perspectives offered, but in the choice of methods. These need to be made carefully with appropriate objectives in sight. Another challenge known to all participatory formats includes the selection of participants for each phase – who's an expert, and who's a stakeholder?

In this process the researchers explore and analyze data, but also facilitate and organize the discourse. It may need the external expert and stakeholders to generate encompassing knowledge for transformative action. Integrating design methods, by creating tangibles and artifacts for instance, should give participating stakeholders the chance to experience their images of the future. Critically, the framework seeks to adhere to scientific standards and generate data that is a viable foundation for further research.

Conclusion

Society does not exist as a single entity or coherent system. Shaping the future can thus only take place selectively, individually, or within a particular community. Science and research today do not only explore what exists, but in projects often have the role of finding new pathways for stakeholders who may have very different goals. Even if the task for *researchers* in futures studies is to observe, document and disseminate, many also serve as *facilitators* in transformative processes to shape and design a preferred future. Therefore, such work needs a distinctive research design structure where the roles can be distinguished.

Design and futures studies have become good collaborators, and the F-D-P model advocates a procedural synergy between them, by designing and experiencing futures, accommodating scientific standards, and adding the option of developing projects as transformative action in the context of sustainable development[6]. The balance between macro- and micro-cycles, as well as analytical and

creative steps, are planned to alternate and mutually fertilize each other. The boundaries are fluid, but a delimitation for project designers is offered via the phased structure as well as the Toolbox questions. It also follows suit with participatory futures' objective of generating knowledge for alternative future paths and empowering stakeholders. The transformative action as a final result may or may not be undertaken in collaboration with designers. As in other participatory approaches, the actual realization of one's own ideas is an important motivator for change (Ramos, 2017) and should be kept as one possible objective in the research design within the F-D-P. It supports the idea of empowering stakeholders to become creators of their future.

Designing the future consciously means creating freedom to think and try the impossible. It includes the constant reassessment of results and the responsibility for one's own actions. Despite the wicked problems we face, and the awareness that there is not simply one right solution, a moderate optimism can ignite hope for a better future.

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Notes

1. https://www.ocadu.ca/academics/graduate-studies/strategic-foresight-and-innovation.htm
2. https://www.cca.edu/design/design-strategy/curriculum/
3. https://www.fh-potsdam.de/studieren/fachbereiche/stadt-bau-kultur/studiengaenge/urbane-zukunft-ma/
4. The design method of Cultural Probes would be an example of such a tool for communication
5. "The True, The Ideal, The Real" derived from. Nelson and Stolterman, "The Design Way", cited in Hugentobler et al., 2004, pp. 6-7.
6. Transformative research understood as transdisciplinary and participatory research in the context of sustainable development could embrace this type of model as well.

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