

## Prototypes and Paradigms

Komossa, Susanne; de Walsche, J.

**Publication date**  
2016

**Published in**  
Prototypes and Paradigms

### **Citation (APA)**

Komossa, S., & de Walsche, J. (2016). Prototypes and Paradigms. In J. De Walsche, & S. Komossa (Eds.), *Prototypes and Paradigms: Architectural Research vis-à-vis Research-by-Design* (pp. 9-22). (DR\_SOM: Design Research, Series on Method; No. 01). TU Delft OPEN Publishing.

### **Important note**

To cite this publication, please use the final published version (if applicable).  
Please check the document version above.

### **Copyright**

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

### **Takedown policy**

Please contact us and provide details if you believe this document breaches copyrights.  
We will remove access to the work immediately and investigate your claim.

**After 10 years of exploring the possibilities and ways to integrate Research-by-Design into Architecture Design Studio Teaching and PHD Theses in Architecture, Landscape Architecture and Urbanism at various universities in Europe and around the world, the time has come to investigate these matured/maturing research approaches in relation to existing paradigms of architectural research & design.**

**The Delft Faculty of Architecture and The Built Environment will thus host, in collaboration with the ARENA Architectural Research Network, the 1st Meeting of a series, which explores and discusses all of the existing and emerging prototypes and paradigms at PHD level in architecture faculties throughout Europe.**

## MAIN QUESTIONS

---

**Can we distinguish certain more or less proven methodological approaches and paradigms for Research-by-Design? And if the answer is yes, what are their aims, nature, validity and contents/products/insights in a qualitative and quantitative sense? What is their contribution to the production of new knowledge and ways of acting as designers?**

**Does it make sense to develop, teach and theoretically underpin new proto-typical and existing paradigmatic approaches/methods to establish more congruent design skills and make 'designer(ly) knowledge' explicit in our fields, not only in Bachelor's and Master's teaching but also at PhD level?**

**Additionally, are these methods and approaches, including their aims, recognised generally within our fields, and also within a wider sphere - for example, funding bodies such as the EU, National Scientific Boards, professional practises, building clients, and the like.**

## ARCHITECTURAL DESIGN RESEARCH COMES OF AGE

---

**In 1997 the very first issue of 'The Design Journal' was introduced with an editorial entitled 'Design Research comes of age', indicating a next stage in the development of a young discipline. (COOPER, 1997) Rachel Cooper, the editor, states that the very nature of design research has been debated for half a century, and that it is time to provide the opportunity for 'design' to be considered as a scholarly discipline as well as a respected profession. In 2010, in the letter section of 'Architectural Research Quarterly', Murray Fraser headlines that 'architectural research comes of age'. (FRASER, 2010) While Cooper is making a plea for design research as an autonomous field, transcending disciplinary borders of engineering, CAD, management, art and design, Fraser emphasises the capacity of architectural design proposals to study the world from the perspective of the discipline. Architectural design, built and un-built, is able to communicate architectural ideas beyond the scope of the project itself. It is offering a necessary alternative to, for instance, the applied instrumentality that can typically be found in the field of environmental design and sustainability. Thereby it can be enriched by the rising impact of critical theory and cultural studies about architecture, and contributes to it, thus expanding the own corpus of research in architecture. Moreover it seems that also practice based**

research and computational experimentation have left their ontological state, and are entering a next stage of development, contributing to the epistemological field of architecture, and tackling cultural, societal, political issues, rather than merely establishing their own reason for existence.

Indeed, after the crisis of the Design Method Movement (UK) and the Design Research Society (US) the belief in developing a unified science able to unravel the underlying mechanisms of design thinking had faded away. (BAYAZIT, 2004) These first generation of design 'scientists', tried to render the process of designing 'scientific', in order to optimize and methodize it. After their major antagonists like Alexander and Jones renounced, the intention to systemize the design process was abandoned, and replaced by the identification of specificities and capacities of 'designerly thinking'. (CROSS, 1982; LAWSON, 1994) These considerations led to value design/designers for its/their abilities to deal with complexity, ambivalence, otherness, uncertainty, contingency et cetera. Gradually, further explorations of awareness, cognition and abilities of designers moved design research from problem solving (during the '60's), over tackling wicked problems (HORST & MELVIN, 1973), to its power of imagination, delivering unexpected alternatives. (JANSSENS, 2008) 'Designerly' ways of thinking, and the power of creative practice could and should lead to generating new knowledge and insights, significant and original, and therefore become pathways of conducting rigorous research.

With the organization in 2000 of the 'Research by Design' conference (TECHNISCHE UNIVERSITEIT DELFT, 2001), the TU Delft was taking up a prominent position in the field. Synthesizing the attempts to identify design as a way of conducting research led to comprehensive publications as 'Ways to study and research; Urban, architectural and technical design'. (DE JONG & VAN DER VOORDT, 2002)

However, the more the twentieth century approach in studying the nature of design and design thinking evolved towards establishing 'design' as an autonomous disciplinary field, the more it drifted away from the interest of designing architects and architectural theorists. While the emancipated 'design science' is successfully offering service to a myriad of other disciplines, such as engineering, software development, management, biomedical technology, it has largely left the field of architecture.

Studying the process of design in terms of systematization, generalizability, predictability, optimization, seems more appropriate for industrial design and technological innovation aimed at industrial production, than it is able to stimulate

designing architects, or trigger researchers in architecture and architectural production.

Indeed, the notion of 'design studies' typically came into existence in the era of technological advancement and manufacturing, let's say from the beginning of the twentieth century onwards, thus dressed up as a symptom of modernity. On the contrary, the origins of studying and theorizing architecture and architectural design as a societal phenomenon and a discipline date back at least to Vitruvius, boosting in the renaissance when architecture was part of the 'artes liberales', developing its own contribution to 'scientia' by producing drawings, paintings and sketches. In fact, since 'we have never been modern' (LATOUR, 1993), conducting architectural research by producing design proposals, and thus mastering the arts of inventio and disegno, is a recuperation of a long tradition. Modernity was just transient, a passer-by. Conducting architectural research by design is in inscription in a continuing community of practice, eventually reconnecting to its disciplinary legacy. Time folds. (SERRES & LATOUR, 1995)

In spite of allegations and reluctance from traditional scientific scholarship to accept design as a valid pathway for inquiry, pioneer institutions, spread all over the world, demonstrated their conviction of the value and richness of design as a rigorous method to study architecture and society. During the last decennium their assertiveness and determination has led to a substantial practice-based research production, which challenges academic skepticism.

Techniques, modes and methods from architectural design practice, from academic research practice and from artistic production exist next to each other. Confrontations produced blends and hybrids, adoptions and adaptations. Universities establish architectural design laboratories, while links with professional practice are arising.

By its intrinsic inclination towards experimentation this emerging field of practice-based architectural research, also nourishes the critical apparatus, offering a new, matured condition of and for reflection and discourse.

There is no longer any merit in demonstrating the existence of high level academic design research, nor in demonstrating the broadness of this field, nor in demonstrating the multitude of issues that it tackles, nor in demonstrating the diversity of approaches and techniques that are involved. We can outdistance the ontological discussions whether design can be research or not, and advance to further exploration of the role and capacities of research-by-design. We can highlight inspiring and convincing practices and advancing findings. We can study

**the position and purpose of design in inquiry, in connection to epistemological frames and paradigms. We can identify epistemologies, methodologies, morphologies and a myriad of techniques, and link them to architectural ideas and concepts, in search for an improved coherence in design research approaches. By dissemination of good practices we can enhance the meaning and capacity of design (as) research for society, profession, science, art and philosophy.**

**There is no reason not to take up the challenge that is put forward in the Sage Handbook of Architectural Theory, namely to start elaborating reflections on the actual attempts to bring architectural design research up to the level of recognized scholarly research by widening the set of available techniques and approaches, and simultaneously expanding the field of architectural research, and by doing so, even academic research in general.** (CRYSLER, CAIRNS, & HEYNEN, 2012)

**With regard to the relationship between academia and professional practice, vis-à-vis the actual situation of economic crises, it becomes evident that architects more than before, have to be explicit about what they can contribute to contemporary global and local challenges. Additionally this period of fast transition urges for new answers and approaches. Architects could and should dwell on the knowledge and action they can produce by designing new kinds of artifacts and projecting new proposals for looking to the future, while being part of multi- or cross-disciplinary research and design teams. Design research matters for both academy and professional practice, and should be conducted and rigorously developed in both environments, whether collaborative or not, since each place - characterized by its own modes, perspectives and conditions - offering a specific scope of opportunities.**

#### CURRENT RESEARCH-BY-DESIGN APPROACHES AND PRACTISES

---

**There are many ways, techniques, methods and approaches, which one might refer to as research-by-design in architecture. Depending on the place where it is conducted, it will have its own scope, modes and methods. Design research can be situated in practice, in academia, or in collaboration between both.**

**Innovation in the field of architectural design and production is largely situated in professional practice. Professional practice typically is an environment where the underlying processes mostly remain tacit. Nevertheless, practice is a source**

**of raw data for architectural theory and a repository of architectural knowledge. Professional practice as locus for observation and inquiry, is offering a crucial position in the mediation between the world of ideas and the world of building. It benefits of a unique relationship with stakeholders, their contexts, and their needs and beliefs. Unravelling the argument of underlying pragmatism and participatory digging into processes of interacting agents will ‘make architecture speak’.**

(TILL, 2007)

**Stimulating professional architecture offices to bring their operational know how in designing at stake as research, instead of only intending to be built, will lead to new insights in the processes of architectural production, and, even more fundamental, to a new profile of the architectural design research office<sup>1</sup>.**

**Mastering architecture as an actor actively involved in its production through design, is a cumulative process of growing experience and personal development, which takes time. The collective body of mastery encapsulated in architectural practice possesses an immense capacity for innovation. This is another argument to investigate design as research situated in professional practice.**

**Leon Van Schaik talks about ‘the broad but unacknowledged mastery in the work of practitioners who had been active for at least a decade’. By asking these practitioners reflect upon the nature of that mastery within a critical framework. Deliberated from the submersion ‘into background noise by the sheer demands of practice’, practitioners are reflecting upon the nature of that mastery within a critical framework, in order to bring them in conditions of transcending mastery, leading to innovation. (VAN SCHAİK, 2005)**

**Academia seems to be a good biotope for two quite diverse types of research. On the one hand one can notice the fast development and growing impact of computational scripting, parametric design, bio-mimicry and the like - close to mathematics, engineering and sciences, at the same time often**

**1** Cases in point are initiatives as the ‘Stimuleringsfonds voor Architectuur’, today called ‘Stimuleringsfonds Creatieve Industrie’ (‘Creative Industries Fund NL’) and ‘Architecture Workroom Brussels’ by Joachim Declerck.

bridging to the arts (visual and other); on the other hand architectural theory and history - connecting architecture to the humanities and social sciences - appeared to be the most susceptible and fertile field to the general request to 'academize' the discipline, in the sense of 'a better embedding in research' as well as in the sense of an increase of the production of research outcome.

But the discipline cannot do without architectural design being the backbone of architectural education and the central and distinguishing feature of the profession and the discipline. As a field of action, and a perspective for research, design offers itself as a way for experimentation and exploration into, by and for architecture. Developed in a way of learning-by-doing and embedded in the specific DNA of various Architecture Schools and Professional Practises throughout Europe specific characters are emerging, approaches become apparent, scopes are taking shape.

PHD research, typically situated within the walls of academia (except the approach of Leon Van Schaik at RMIT) renders its own scope. Murray Fraser classifies the typical broad-brush range of PHD-type studies that one comes across at the Bartlett into four categories (although, Fraser states, 'as with all classification systems always rather provisional and uncertain'): (1) those which look at more 'internal' matters such as issues of architectural discourse, meaning, representation; (2) those which seek instead an interdisciplinary practice, or cross-disciplinary practice, with 'external' subjects such as art, photography, design, curatorship, anthropology, philosophy; (3) those which pursue a far more technological or sustainability or fabrication trajectory as their theoretical basis; and (4) those which aim to be located in some kind of mediated practice or 'live' practice work in the world outside academia. These categories of course, as with all classification systems should be considered as rather provisional and uncertain. It also should be clear that the real attraction of design research is precisely because it is so diverse, complex and emergent in its approach<sup>2</sup>.

The Sint Lucas School of Architecture in Ghent/Brussels organised - based on the initiative of Johan Verbeke - during the



past eight years three international conferences addressing the issue of the PHD in Arts and Architecture. The series started with ‘The unthinkable doctorate’ (BELDERBOS & VERBEKE, 2005), which was followed by **Communicating (by) Design** (VERBEKE & JAKIMOWICZ, 2009) and **Knowing (by) Designing**. (VERBEKE & PAK, 2013) The conference proceedings of all three conferences serve as an excellent overview and reference for what one could call design research directed to creative practise in the arts, including architecture, music and visual arts.

At the University of Antwerp the proceedings of the conference **Theory-by-Design, Architectural research made explicit in the design studio** (DE VOS, DE WALSCHE, MICHELS, & VERBRUGGEN, 2012) explore the scope of knowledge and insights that (only/typically) design can generate and transfer, by presenting a broad range of case studies regarding studio teaching by design. Based on this overview Johan De Walsche discerns (provisionally and at least) seven purposes for design to be the appropriate way for generating the insights that where aimed for: (1) design as a specific case of creative practice, revealing insights that can be grasped only within the mental and/or bodily condition that is caused by the activity/ experience of designing. A special case of this kind of design research is ‘developmental’, meaning that it is intending to improve and innovate the design process itself; (2) design through making (for instance of built proto-types and physical demonstrators), revealing insights that can be obtained only by interaction with the implications of materialising; (3) (computational) design experiments, as a way of exploring, rediscovering and redefining architecture as mimesis of nature; (4) design as (virtual) prototyping, aiming at the invention and demonstration of new architectural/urban/ territorial models and typologies; (5) design as a vehicle/tool for the analysis and exploration of architectural/urban/territorial issues; (6) design as spatial scenario writing in order to evaluate future realities (anticipatory design research); (7) design as a way of conducting action research, aiming at a evaluating, documenting and developing processes of intended (societal) change.

At the Delft Faculty of Architecture, the debate on research by design is flanked by the of several specific architectural research approaches, established in the frame of the Department of Architecture. [1] **Hunting & mapping** aims at gathering yet unknown substance, for example the public realm in situ, and ordering themes and substance by visualizing them. Instruments applied are tools, like writing and sketching, street photography, interviews, data collecting and the like. As in Antwerp, scenario writing & drawing elaborating the ‘narrative’

and position with regard to theme, site, program and future reality is considered a valuable tool within the research and design process. [2] Plan analysis, the comparative study of built prototypical precedents (and/or oeuvres of architects) focusing on canonical buildings are regarded as means to enlarge designer(ly) knowledge in order to bridge the gap between analysis and design. [3] Typological research interprets basic building configurations from both historical and contemporary paradigms. This research investigates foremost the typological features of buildings and urban blocks and their immanent, tacit qualities. Understanding the way, in which certain architectural typologies and models<sup>3</sup> transform through time, renders additional knowledge on how to manipulate, reuse, recombine and transform existing typologies to arrive at new ones. Moreover [4] typo-morphological research addresses the physical structure of buildings, blocks, cities and territory on different scales. It helps to understand the historical transformations of types and models. [5] Morphogenetic research deals with the performance of architecture, in regard to use, reuse and transformation, and everyday life and its practice through time. This research poses the question how the actual use influences the buildings and spaces, and vice versa. [6] Phenomenological research addresses the way in which architecture is perceived. It addresses the composition, tectonics and material qualities of the architectural design, including colour and ornament and the impact of art. Within the design process addressing the (future) perception of architecture always is speculative, based on unproven evidence, i.e. intuition combined with reason. This approach rejects prescriptive methods but instead embraces capabilities like free association, sudden leaps, inversion of times, mimesis and the like. (CROSS, 2011)

3 Castex et al. define the architectural model as the actual architectural project, based on specific rules, concepts and techniques. Various projects may share the same rules and techniques resulting in distinguishable architectural or urban planning models. One could say, in each plan and design, forms and operations are expressed that structure their composition, which refer to a set of concepts, references and specific techniques that serve as the basis for the design.

The aim of this meeting, being the first in an ARENA series on ‘method’ in design research, is to filter and sharpen the agenda of next meetings, which will focus on evidence by good practice as a result of matured and convincing approaches on PHD level and/in more or less established/defined research contexts.

For this first meeting we invited scholars that (re)present approaches linked to the research practices in Delft that are listed above. They are mainly based on drawing as a research tool and as a substantial part of the research outcome. Two of the invited speakers, Carlos Dias Coelho from Lisbon and Pier Vittorio Aureli from The Berlage Institute Delft / Architectural Association London, operate in the field of typo-morphology i.e. urban form study. Marc Schoonderbeek, from TU Delft, explores mapping as a tool for research and design.

**The FORMA URBIS LAB, Faculdade de Arquitectura, Universidade Técnica de Lisboa guided by Carlos Dias Coelho**

The FORMA URBIS LAB of Carlos Dias Coelho is a group of researchers and PHD students that during the past years produced an Atlas of Squares in Portugal. ‘A praça em Portugal’ documents squares, which all are unique in their kind. With regard to urban ‘squares’, no comparable studies have been conducted since the analyses of Sitte.

The first volume of the ATLAS OF SQUARES starts with a theoretical, historical and methodological underpinning of the work. Additionally the introduction renders a short typological comparison of squares in Portugal, their history and background.

Each individual square is presented in the same way and on the same scale, ranging from an aerial photograph, photographs of the square, drawings of the position within the city stressing the network of public spaces, an axonometric, the floor plan and cross-sections.

Also within the PHD research the FORMA URBIS LAB operates on the interface between architecture and urbanism. Next to the Atlas work on squares the PHD students of the lab develop their individual research, which is related to morphological transformation of urban artefacts (streets, building blocks...). They try to depict the actual architectural composition and design solutions, and look for underlying design paradigms dealing with specific circumstances, for instance heights differences within building blocks due to topography. Moreover, following Castex the research lab is interpreting the inner logic that links the design to societal change.

Basically the research of the **FORMA URBIS LAB** renders knowledge that is relevant for a broad range of contemporary design questions. For example, how to value the development and (non)design of certain ‘modern’ squares, shopping streets, building blocks and areas. Moreover the research approach of the lab allows speculation on for example the historical, lay-out of cities like Evora and Lisbon with regard to whipped out traces of the former positioning of mosques, amphitheatres and the like, in this regard even supporting archaeological research and, in the long run, contemporary tourism.

**‘The City as a Project’ PHD group of the Berlage Institute Delft, supervised by Pier Vittorio Aureli**

Also the work of the PHD students of the Berlage Institute centres on architectural drawing as a solid ground for architectural evidence. Its main focus, according to Pier Vittorio Aureli, is the interrelationship between architectural form, political theory and urban history. Aureli understands urban form as a highly politicised instrument of power. The work of the PHD students centres on the generic, the common in urban architecture. Generic building types, urban blocks and other artefacts are understood as paradigms that need investigation and understanding with regard to their political means, re-evaluation and in the end re-appropriation by the people/architects to allow changes in production and political life.

The program allows the students to follow their personal fascinations for analysis. For instance the architectural configuration and meaning of the Via Appia in Italy, is studied, or the Athens’ frequently occurring building type of the urban villa. Applying meticulous drawing on a variety of scales together with written and historical sources, the work documents and interprets the historic form and genealogy of the design up to its actual appearance. Moreover the research perspective of the program questions how building type and urban form influence or even determine life of city inhabitants and, by the specific division between private and public, allow or repress political life and subsequently socio-economic change. To arrive at options for change, speculation is applied in the form of questions/drawings that render ‘The possibility of...’ or ‘What if....?’. This allows for elaborating alternatives for a possible future, offering additional knowledge and viewpoints, eventually acting to change the political meaning of urban artefacts. In a way Aureli’s approach is a continuation of the approach of the Warburg Courtauld Institute Hamburg/ London, where the architectural historians Rudolph Wittkower,

and later Colin Rowe developed a methodology based on extensive documentation in drawing and text followed by an interpretation of both sources. Additionally, speculation is/has been applied to arrive at new insights.

**The ‘Architecture; Borders & Territories’ research group at the Faculty of Architecture and the Built Environment, Delft University of Technology, coordinated by Marc Schoonderbeek**  
The research activities of the ‘Architecture; Borders & Territories’ group, coordinated by Marc Schoonderbeek, focus on the emergence of the architectural project and its related theories. Their research explores architectural design as a process in which contextual readings are considered of vital importance. In terms of analysis, this means an understanding of the architectural material itself as being crucial for the process of projecting the characteristics of the work to more general theoretical insights. In terms of a design process, a clear delineation is proposed with regard to the way in which contextual information (in)directly determines architectural design processes and as a consequence, ultimately ‘constitutes’ architectural form. The group describes this process as an ‘internalization of the external’.

The B&T research involves three main fields of interest, namely a clarification of the discursive field in which architecture nowadays operates - including the ‘borders’ of the discipline -; the development of operational tools with which the architectural project is conceived (mapping, literary techniques, sampling, etc.); and the careful consideration of the representational techniques with which these processes of operationalization, both on the level of theory and design, occur (for instance the formal language developed by Tschumi in *Manhattan Transcripts*).

The architectural project is not considered as an object of study that continues a specific historical discursive tradition, but as a generator of the ‘new’. The basic premise behind this line of thinking is that the ‘catalogue of possible architectural forms’ is neither complete nor exhausted. In this research, therefore, ‘other’ possibilities of architecture are addressed, by speculating on the relevance of (1) the use, appropriation and application of methods and tools that come from outside the discipline (cartography, literature, art, philosophy) or (2) those architectural objects and projects that have, until recently at least, not been considered as architectural ‘material’ as such.

Mapping, which will be discussed during the keynote-lecture, is considered particularly relevant in this context. By considering mapping as both a design tool and a research tool

simultaneously, mapping avoids the banality of problem-driven design. In contrast, it opens the design process towards the incorporation of the subjective. The ‘place-time discontinuity’ of mapping provides the possibility of speculating upon unexpected relationships and different meanings of architectural work.

**Finally, Johan Verbeke** provides an overview of the way in which Research by Design indicates a paradigm shift within architectural research, education and design practice. After a long search of approaches and methods – derived or ‘lent’ from a extensive field ranging from humanistic disciplines reaching from sociology to architectural and art history – Research by Design in all its forms proved to meet the specific character of architectural design as theory and practice. Especially in architecture schools springing from a beaux-arts tradition, i.e. an artistic background, this approach opened up avenues for several ground breaking academic PhD programs in Belgium, UK, Scandinavia and Australia. However, notwithstanding of Research by Design becoming of age and rendering several modus operandi an array of problems still has to be catered to. On a European level, for example within the Horizon 2020 funding, proposals for architecture research and training programs still have to apply in either the categories of technical sciences or humanities. In fact, currently there are no categories to fill the gap. In addition, casting a new light on combining engineering and artistic traditions and ‘designerly’ thinking remains a challenging issue that deserves further elaboration in the near future.

Johan De Walsche, Susanne Komossa  
October/November 2013

## Bibliography

- Bayazit, N. (2004). Investigating Design: A Review of Forty Years of Design Research. *Design Issues*, 20(1), 16–29. doi: 10.1162 / 074793604772933739
- Belderbos, M., & Verbeke, J. (2005). The unthinkable doctorate : proceedings of the colloquium 'The unthinkable doctorate' at Sint-Lucas Brussels from 14–16 April 2005. Brussels: Hogeschool voor Wetenschap & Kunst Network for Theory, History and Criticism of Architecture.
- Cooper, R. (1997). Design Research Comes of Age. *The Design Journal*, 1(1), 1–1. doi: 10.2752 / 146069297790219431
- Cross, N. (1982). Designerly ways of knowing. *Design Studies*(4), 221–227.
- Cross, N. (2011). *Design thinking : understanding how designers think and work* (English ed.). Oxford ; New York: Berg Publishers.
- Crysler, C. G., Cairns, S., & Heynen, H. (2012). *The SAGE handbook of architectural theory*. Los Angeles, [Calif.] ; London: SAGE.
- de Jong, T. M., & van der Voordt, D. J. M. (2002). *Ways to study and research : urban, architectural, and technical design*. Delft, The Netherlands: DUP Science.
- De Vos, E., De Walsche, J., Michels, M., & Verbruggen, S. (Eds.). (2012). *Theory by Design, architectural research made explicit in the design teaching studio*. Antwerp: Faculty of Design Sciences, Artesis University College, Antwerp University Association.
- Fraser, M. (2010). Architectural research comes of age. *Arq- Architectural Research Quarterly*, 14(1), 8–9.
- Fraser, M. (Ed.) (2013). *Design research in architecture : an overview*: Ashgate Publishing Limited.
- Horst, W. J. R., & Melvin, M. W. (1973). Dilemmas in a General Theory of Planning. *Policy Sciences*, 4(2), 155–169.
- Janssens, N. (2008). Designerly thinking and research. *Reflections*, 7, 203–211.
- Latour, B. (1993). *We have never been modern*. Cambridge, Mass.: Harvard University Press.
- Lawson, B. (1994). *Design in mind*. Oxford [England] ; Boston: Butterworth Architecture.
- Serres, M., & Latour, B. (1995). *Conversations on science, culture, and time*. Ann Arbor: University of Michigan Press.
- Technische Universiteit Delft, F. B. (2001, November 1–3, 2000). *Research by design : international conference November 1–3, 2000 : proceedings*. Paper presented at the Research by design, Delft.
- Till, J. (2007). What is architectural research? Retrieved 27 september 2012, from <http://www.architecture.com/Files/RIBAProfessionalServices/ResearchAndDevelopment/WhatisArchitecturalResearch.pdf>
- Van Schaik, L. (2005). *Mastering architecture : becoming a creative innovator in practice*. Chichester ; Hoboken, NJ: Wiley-Academy.
- Verbeke, J., & Jakimowicz, A. (Eds.). (2009). *Communicating (by) Design: a joint publication of Chalmers University of Technology and Hogeschool voor Wetenschap & Kunst - School of Architecture Sint-Lucas*.
- Verbeke, J., & Pak, B. (Eds.). (2013). *Knowing (by) Designing: LUCA, Sint-Lucas School of Architecture Ghent/Brussels and KULeuven, Faculty of Architecture*.