

Design, Designerly Enquiry and Design Research

Exploring Design-Driven Study Approaches in Architectural Research

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1. Introduction

This contribution explores – and attempts to chart – opportunities for *design-driven* approaches in architectural research. Starting with a brief investigation into the broad domain of architectural design and its working methods, the relationships between design and scientific methods of research are evaluated. The discourse focuses on instrumental and methodical aspects that may be considered relevant when approaching products and conceptions of design within a research context. It is argued that *designerly* modes of enquiry offer meaningful opportunities for innovative design-driven research. In this context, the perspectives for design-driven research in academic environments are examined.

On the basis of previous experiences with design composition exercises and workshops, eight types of design-driven types of research, divided into two main clusters, are identified and characterised. The methodological approaches addressed in this overview vary considerably, from more or less familiar forms of design based research to more speculative approaches, involving design(erly) activity as an integral part of the research method. This typological mapping exercise reflects upon a number of design-driven research initiatives developed at the Delft Faculty of Architecture – and specifically the Delft Form & Media Studies group – over the last years.

2. Design

How should architectural design be considered in a (scientific) research perspective? What are the aims of design activity? Can characteristic methods of design be identified?

The act of designing is a form of creative organisation, which takes place on different 'levels' within an overall design concept (often on different levels simultaneously). A design is a 'work in progress,' which is gradually developed and refined from an initial idea to a built environment. In the course of the design process a designer generates design propositions, which are judged on the level of functional, structural, material and aesthetic merits, to name but a few. Designers work towards proposals, which offer a fitting 'answer' to a specific context, with a given programme and economic constraints. At the same time they endeavour to create authentic, even novel proposals: end products which are experienced as more than a sum of separate solutions: as a synthesis of form, material and space (Kurokawa 1991 even suggests that design elements should be considered to coexist in a state of *symbiosis*).

In their work, designers address a variety of formal themes, such as: order and contrast; size and proportion; rhythm and (inter)space; symmetry and asymmetry; symbol and ornamentation. They (either consciously or subconsciously) exploit the expressive qualities of materials and the effects of light and colour, in order to shape new architectural objects and environments. On a compositional level this may involve creating visual balance and tension

between different, constituting parts, but the design ought never to be perceived as a loose conglomerate, which might start ‘falling apart.’ In a kind of ‘balancing act’ between order and chaos, the designer tries to achieve a form of harmony throughout the composition as a whole.

In contemporary architecture there is a tendency not to adhere to any predetermined, binding themes – or indeed methods - of design, but rather to make choices within a framework of plan-specific design rules developed *per project*. The cultural climate of the twentieth century fin-de-siècle seems to have given rise to a tendency amongst trend-setting designers to keep surprising their audience with ‘original’ solutions in order to stay in the limelight. The present-day architectural ‘landscape’ offers both the familiar and the innovative: convention *and* invention. We bear witness to a constantly shifting ‘parade’ of architectural forms and themes. There is no generally accepted architectural style, no standard set of rules.

Design processes tend to be iterative, following a series of successive design ‘loops.’ At any given point, the ‘state’ of the design is evaluated in relation to previous steps and successively developed further. It is essentially a process of creative *imaging*, as Zeissel (1984) has indicated. Imaging is a form of communication with oneself (and consequently, with other partners in a design team), a way of questioning or verifying the merits of intermediate design ideas and developing new options and strategies. As such, the imaging process is a way of ‘channelling’ inspiration; the designer thinking while doing and reacting directly to ideas as they are being visualised, reflecting, eliminating and refining, subsequently making decisions and documenting the results. By determining criteria (but frequently on the basis of ‘taste’) judgements are made concerning the qualities and potentials of different ideas. Designing is a specialized, unpredictable development process which is largely *visually* generative and reflective – and to a large extent pre-linguistic. Viewed in this light, the *imaging* process, involving the active use of various design media should perhaps be regarded as the most enduring method of design. One might even go so far as to say “the medium *is* the method” (Breen 2000a).

3. Design and research

What is the relationship between design and research? To what extent might design products be considered as research output? What are the characteristic aims and methods of design-oriented research?

It may be clear that design is a broad field of enterprise that cannot easily be ‘tied down.’ Working methods and formal themes tend to be determined by personal preferences and constantly shifting cultural, technological, economic, aesthetic and ecological – developments.

Clearly, design processes are not orderly and linear, but unpredictable. To an outsider they may seem haphazard and erratic, even chaotic. This may be one of the most important reasons why design is still frequently viewed with scepticism by more or less traditionally inclined academics. On the other hand, projecting scientific models of thought onto such a complex, varied and layered domain can easily lead to gross reductionism or simplification, in which case the – so called research findings will not be taken seriously by critical design practitioners.

It is important to realise that design practice and design research are activities, which, as it were, move in different directions, back and forth between (historical and contemporary) culture and (technical and applied) science. Architectural design – as a development process – is both imaginative and rational, drawing from a wide range of knowledge and experience, concerning technical, practical *and* cultural aspects. An ‘in-between’ realm: broad and multi disciplinary; traditional as well as innovative; stretching into the domains of the Technical Sciences on the one hand and those of the Arts on the other.

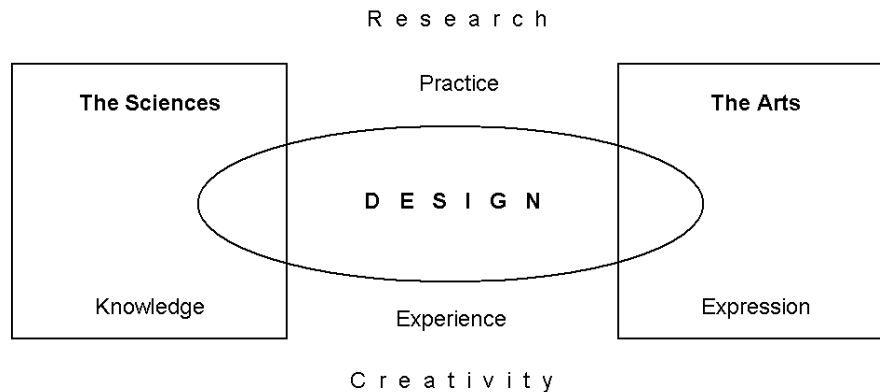


Figure 1: The in-between realm of design.

Scholars find themselves confronted with an enormous quantity and variety of architectural artefacts - each with its own specific context and characteristic synthesis of space, form, material and detail. How should researchers set about exploring this extensive field of enquiry?

A design product should not automatically be considered as research output. This can only be the case if scientific criteria are met. A designer is primarily involved in a concretisation process, aimed at reaching a solution, which is – in principle at least – ‘build-able,’ whereas a researcher is involved with the evolution of knowledge.

Design research may target distinctly different areas of design activity, such as product development (devising new or better building components and technical solutions) or practical applications (aiming at the development of methods and new design tools) but a great deal of design-driven research is aimed at understanding the workings and backgrounds of designs and design thinking. This is essentially fundamental research, even if the subject of study is by definition not ‘pure,’ but complex and applied...

4. Designerly enquiry

Which types of study might be considered to be appropriate to the realm of design? What are the potentials for approaches involving controlled design activity in design education and design-driven research?

The designer is involved in problem solving, using his or her imagination to develop - and indeed to predict - a successful final solution. However, design solutions are expressed not so much as answers, but as propositions. The designer’s thinking process is essentially a process of formal transformation. This design ‘searching’ involves specific kinds of active exploration, imagination and evaluation, a characteristic trait for which Bruce Archer has introduced the term “Designerly Enquiry.” As Archer states: “*The idea of Design as a broad area of man’s concerns, comparable with Science and Humanities, seems to be defensible in pedagogic terms. The idea that there exists a designerly mode of enquiry, comparable with but distinct from, the scientific and scholarly modes of enquiry seems to be defensible by the design methods literature*” (Archer 1981).

Designerly thinking can be considered as a kind of problem solving mental experimentation, which transforms a relatively complex problem into a workable solution, which may be tested, judged and effectuated afterwards. Other activities requiring such foresight, such as setting up workable a planning, developing an educational curriculum or organising a sound research experiment, could also be considered as forms of designerly enquiry...

In this context, the term designerly enquiry seems particularly appropriate, precisely because it has a certain, elegant ambiguity. It is a concept which can denote practical designing activities, but also suggests an ‘as-if’ design practice approach, which may be of particular relevance in design education as well as in research experiments.

5. Research, education, practice

Which characteristics of designerly enquiry might be considered pertinent for other forms of design-based study, such as education and research?

Whereas traditional design activities are primarily involved with the development of design products and design studies with knowledge, in design-driven education the processes are characterised by reciprocity between the two. In the academic environment, the aforementioned ‘as-if’ design setting is the norm, whereby design and research activities are primarily targeted at the generation of knowledge, insights and skills. Thus, the aim of designerly exercises, integrated into educational curricula, is one of learning *by* doing. For the time being, the results remain ‘conceptual,’ as the students’ propositions are hardly ever realised in built form.

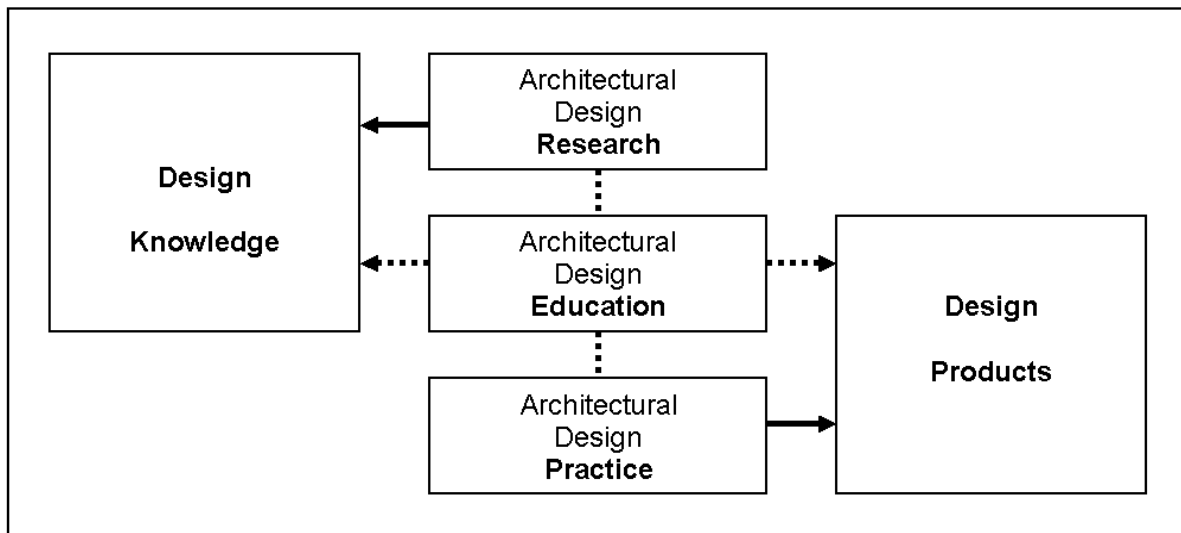


Figure 2: A comparison of orientations in research, education and practice.

A traditional approach to the teaching of design involves students - as ‘apprentices’ - to repeatedly carry out integral design tasks under the critical supervision of a ‘master.’ With such an organisation, there is the risk of a ‘black box’ situation, with relatively little transparency on the level of the objective exchange of ideas or evaluation of results.

A pedagogical alternative is to set up clearly structured courses, which incorporate designerly activity, aimed at the *exploration* of architectural design issues. An effective way of ‘channelling’ student activities towards research is by creating a kind of ‘game’ situation. Donald Schön (1992) and colleagues, who have carried out explorative design exercises with considerable success at MIT, have amongst others promoted such a method. The more clearly such tasks and objectives are defined, the more profoundly the students may be made aware of the constraints on the one hand and the creative freedom on the other hand. An advantage of such a structured approach is that in principle results can be compared relatively objectively, whereby the qualities of specific design solutions can be recognised and discussed.

Well-organised design-driven study projects in an educational environment can create a kind of 'laboratory' atmosphere, in which procedures and results can be considered relatively objectively. Of course the disadvantage of projects involving groups of students is their relative lack of experience. However, this is often compensated generously by their candour and lack of 'hang-ups,' which can lead to refreshing viewpoints and surprising insights. Examples of such a thematic, designerly approach in an educational setting can be found in the Delft Form Studies programme (Breen 2001).

6. Overview: design-driven research approaches

There are numerous ways in which designs or design processes may give occasion to academic research initiatives.

On one side of the spectrum, design activity may be incorporated into the development of technical applications or product innovations. Such an approach is similar to the practice of research and development, which is common in industry. Such developmental research plays a meaningful role within (technical) university environments and might be expected to be stimulated further in education. A pertinent example of such Development Research at the TU Delft Architecture faculty concerns the evolvment of new forms of structural glazing and façade systems for twisted building volumes; refer to Vollers (2001).

On the other side of the scale we may find the kind of research whose primary aim is to explain the implications of design interventions. The focus could for instance be functional, ergonomic, psychological, societal or philosophical. Such research generally considers design results and processes from a certain 'distance' and makes use of proven methods closely linked to the acknowledged empirical cycles of research. The results may often lead to valuable insights but are not always held in high esteem by design practitioners and teaching staff.

Between these poles the endeavour of design composition studies may be considered the issue of research. Composition research can involve the conception and perception of the overall design and its constituting parts. It may be concerned with the *workings* of design results, but also the *methods* of design, including the utilisation and effectiveness of design media in the development process.

On the basis of experiences in design practice, education and research, an attempt was made to identify relevant paths of study. The following typological overview is divided into two main clusters of - design-driven - research approaches. In the first cluster design results (artefacts and design data) form the hub of the research initiatives, in the second cluster it is the design process that is made instrumental.

Each cluster is subdivided into two sub clusters (A and B), each consisting of two approaches, whereby A indicates research types which are more or less familiar, with specific merits but also inherent shortcomings, and B denotes somewhat less proven, but potentially innovative research procedures, with relatively more emphasis on designerly methods of enquiry.

The projects, which are put forward as being indicative of these eight approaches, are for the most part taken from research initiatives at the TU Delft Architecture faculty in recent years.

7. Design-driven research typology

Cluster 1: Design artefact driven research

In the first category the *outcomes* of design activity are central to the research undertaking. The initiatives discussed are primarily focused on products of design processes (which do not always reveal a very clear line of development).

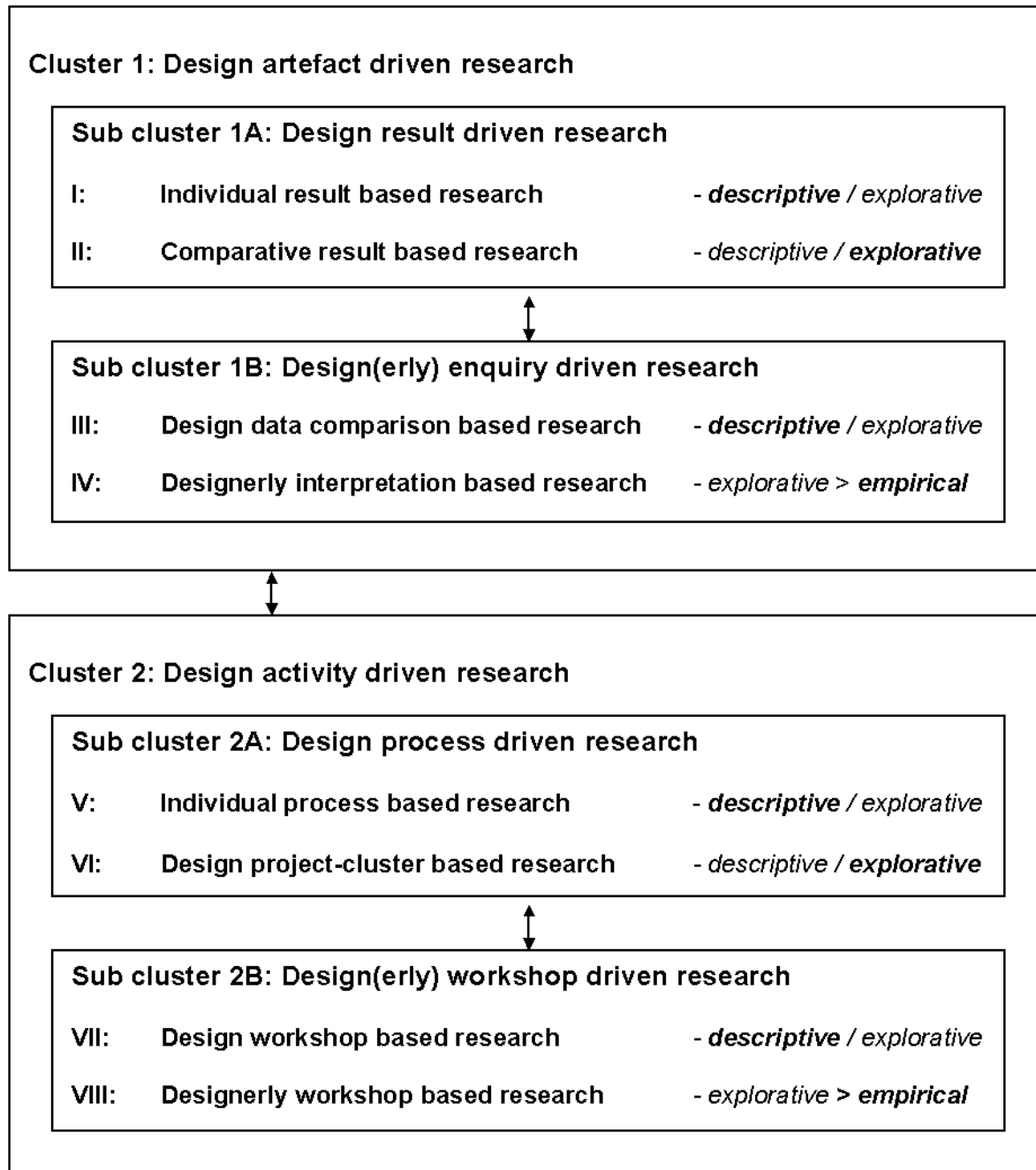


Figure 3: Typological overview of design-driven composition research approaches.

Generally speaking, in these types of study, a design's development cannot be monitored or be 'reconstructed' conclusively on the basis of the process data. The subject and form of such research may vary. The subject matter may consist of one specific design but can also be a concise collection of designs, such as an architect's oeuvre. The research method may include design result analysis, possibly involving relevant references or even comparative studies (sub cluster A) on the basis of tangible results. Alternately, researchers may attempt to get behind the implications and workings of design artefacts by studying intermediate design data or even by 'constructing' alternative design options in order to throw a light on what a design has become (and why) through systematic simulations of what it *might also* or *otherwise* have become (B).

The content of such research will generally come from design practice. The artefacts, which are studied, can vary from emblematic, historic precedents to contemporary products, potentially even including designs created in an educational setting.

The research output can essentially be descriptive, illustrating and communicating the qualities of artefacts considered worthy of study, but might also be more explorative, with the intention of discovering more general 'truths' concerning such aspects as context, design culture, composition or perception.

Cluster 2: Design activity driven research



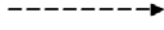


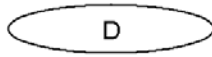

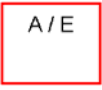




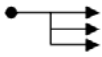


In the second category the design *process* is dominant and tends to form a continuous line from the beginning to the end of the research project, which is as it were constructed around the design's (expected) development.

Generally speaking, a clear notion of the research ambitions should be apparent from the outset, whereby the design development process can be monitored to a large extent. As such, projects of this nature can be said to be process driven and the design process characteristics, results and findings constitute significant a part of the research output.

The content of the research activity is largely determined – one might say initiated – by the designerly 'search' of individuals or groups of designers. The extent to which the designs that are reflected upon are 'let through' into the research project's outcome can vary from an integral, broad representation of designs generated in the process (sub cluster A) to projects with a more rigorous form of scrutiny, filtering and selecting data concerning issues which are at play (B). The design projects, which are the subject of study, may be situated in practice (for instance from competitions) or in an educational environment. Instead of following design processes and their outcomes from a relatively safe distance, there is a preference towards setting up controllable, game-like situations with specific, pre-set tasks and contextual constraints, creating something approaching a 'design laboratory' situation. The search for ways to create experimental design conditions has been a central theme in the Form & Media research programme during the last few years.

Each of the eight research methods identified here is put forward using a scheme (indicating the impulses and 'flow' of the study trajectories), highlighting procedures. In an accompanying text, some characteristic aspects of study are noted and examples of applications (primarily studies carried out at the Delft faculty of Architecture in recent years) are discussed briefly.

Table 1: Legend of symbols used in the schemes of design-driven research approaches.

	Start design process (research initiative)
	Teaching initiative / possible teaching initiative
	Design process (not monitored)
	Design process (monitored)
	Design process (indicating design decision making)
	Design product – single artefact (plus references)
	Design products – collection of artefacts
	Analysis / Enquiry
	Research initiative
	Research relationship
	Project data analysis
	Comparative data analysis
	Designerly interpretation
	Design product as (a part of) research output
	Research project

A relatively familiar form of architectural research, whereby the *results* of design processes usually form the departure point for a detailed, methodical evaluation. The subject might be a realised building or ensemble, but may also consist of a collection of design data (drawings, models, written information), referring to a project, which has not (yet) been realised. The method of study usually amounts to analytical evaluation and descriptive documentation of the design artefact, whereby the researcher may try to ‘work back’ through the design data in such a way that light is thrown on how design decisions or working methods have fundamentally influenced the design outcome. Another method is to consider a design from a particular viewpoint, with an open eye for the design’s context and the designer’s motivations and convictions. By comparing the artefact with precedents, or cross-referencing with designs from the same period or with other designs from the same designer or a particular movement, conclusions may be drawn concerning a project’s meaning and its cultural or technological impact.

In such research the definitive design result is usually the dominant factor, whereby the decision-making process is often of secondary importance. The approach is primarily descriptive, intending to uncover relevant background information and to offer insights into the compositional qualities and cultural or historic connotations of the design product that is studied.

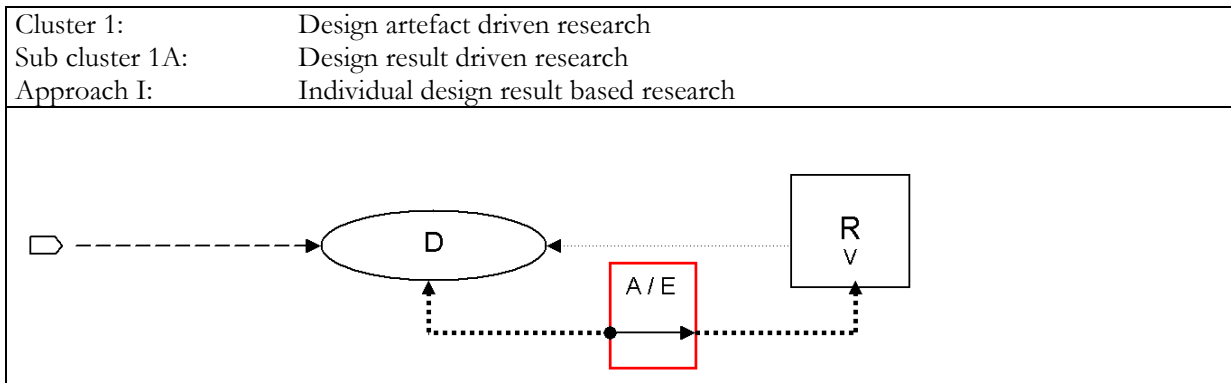


Figure 4: Scheme of Type I: individual result based research.

As such, the research tends to focus on artefacts, which are considered worthy of mention in the context of historical study or contemporary debate. In such a type of study it is important to clearly define beforehand where the emphasis should be placed, what the reference points of study are to be, in order to create conditions for objective reflection. If this is not the case, the work may come across as journalism rather than being as a scholarly undertaking. We see many studies of this sort, which are carried out and published, frequently in the ‘border zones’ of academic enquiry and descriptive reporting.

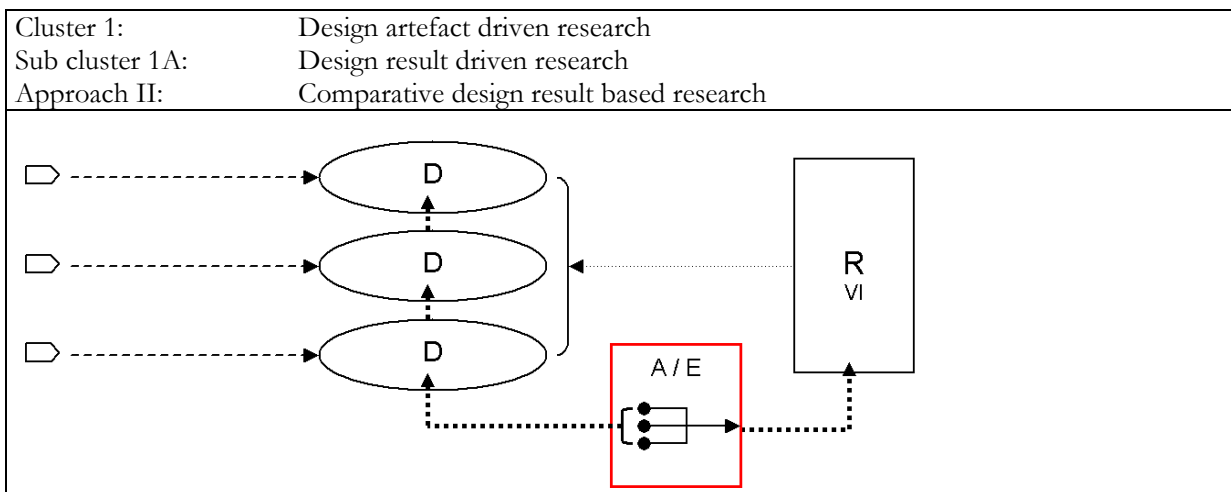


Figure 5: Scheme of Type II: comparative result based research.

An approach with has distinct similarities to type I. However, in this type of architectural research the design cases which are studied are usually grouped and juxtaposed in such a way that they may (be expected to) shed a light on each other, to offer insights concerning characteristic similarities and analogies, as well as identifying the crucial *differences* between the objects of study.

Such case-based studies offer an efficient way to study the compositional aspects of architectural artefacts. Exploration of the design aspects of such ‘collections’ of projects or oeuvres can shed a light on the underlying compositional themes and convictions and the effects of different architectural design interventions. Such analytical, comparative research, generally on the basis of built environments and design documents, tends to be explorative in nature, involving not only the description of what there is, but also the identification of distinguishing consistencies and patterns in variation.

The format of output may influence the working methods. For instance: an exposition format may be chosen, in order to allow viewers to make their own comparisons. This means that the material is to be ordered and visualised in such a way that it will facilitate such mental activity. Apart from familiar descriptive methods, more designerly approaches may be employed, for instance by making new drawings, schemes and particularly: models on the basis of existing information. Such an approach may prove instrumental in order to communicate the results to others, but can potentially contribute to the making of discoveries in the context of the research process itself.

An example of a study involving the unbiased investigation and documentation of artefacts by groups of students was the 'Raumplan versus Plan Libre' project, a comparative study focusing on design modes in the work of Loos and Le Corbusier (Risselada 1987). This method has subsequently been applied with some success to further oeuvre studies by research groups organised around Max Risselada, concerning the work of Prouvé, Scharoun, van den Broek, the Smithsons and others.

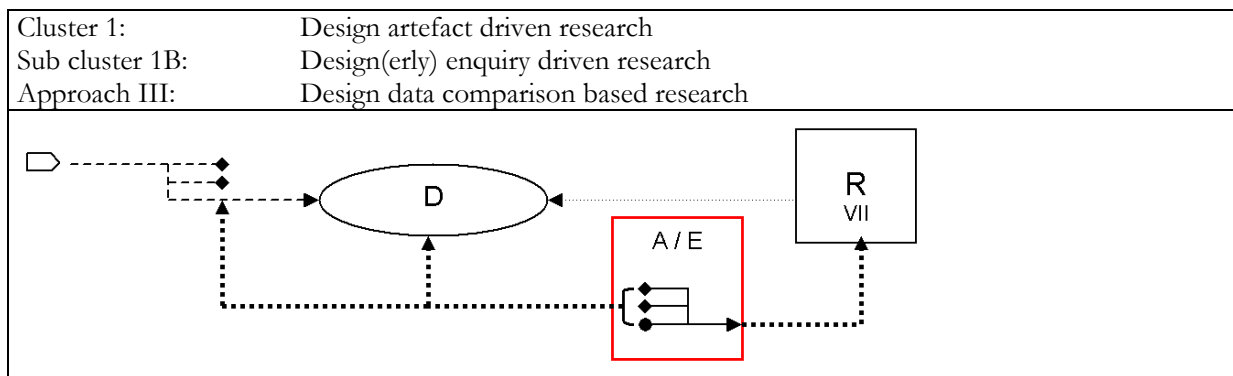


Figure 6: Scheme of Type III: design data interpretation based research.

In document-based research it is not only the *end* results of designing activity which count, but it is particularly the design *process* leading up to the final product which is explored and documented.

This may be done in order to add to the body of knowledge concerning the artefact(s) in question, but in addition might be to elucidate on a designer's motives, attitudes or methods. Such research may also have a more general ambition, such as identifying representative design phenomena and their effects. The subject of study could be a specific design artefact but may also consist of a collection of designs with some identifiable relationship.

There are clear parallels between this type of approach and type II. However, apart from being descriptive, such a form of research can often be explorative. The process involves 'reconstructing' design choices from data that may not always be consistent. An example: a 'definitive' design drawing that does not correlate with the photographs of a (possibly demolished) realised building. The designerly interpretation of design data requires a kind of detective spirit, the researcher attempting to uncover what is 'behind the event' (such as the intentions underlying the visible result) of the design in an objective, methodical manner.

The specific aims and methods may vary, depending upon the project at hand. It may be necessary to 'fill in the gaps' and possibly even to extrapolate design developments on the basis of existing data. Alternately, the starting point might be a building, which has been altered, whereby the task is to virtually reconstruct the design as it once was - or indeed, was intended to be.

Research on the basis of design data is relatively familiar. An example of an exercise involving active interpretation by students was the ‘Un-built Loos’ project at the TU Delft’s Architecture faculty. The task was to ‘complete’ house designs by Adolf Loos, which had never been built (a bit like asking students of music to complete an ‘unfinished’ symphony). This potentially innovative project would have deserved to be worked out more convincingly and documented more systematically (Saariste and Kinderdijk 1992). A recent example of a document-driven research project was the international Mel’nikov study, in which the use of physical models played an important role in the compositional ‘reconstruction’ of a series of iconic projects (Fosso, Mácel and Meriggi 2000). For an insight into such a model-driven research process, see: Mácel and Nottrot (2001).

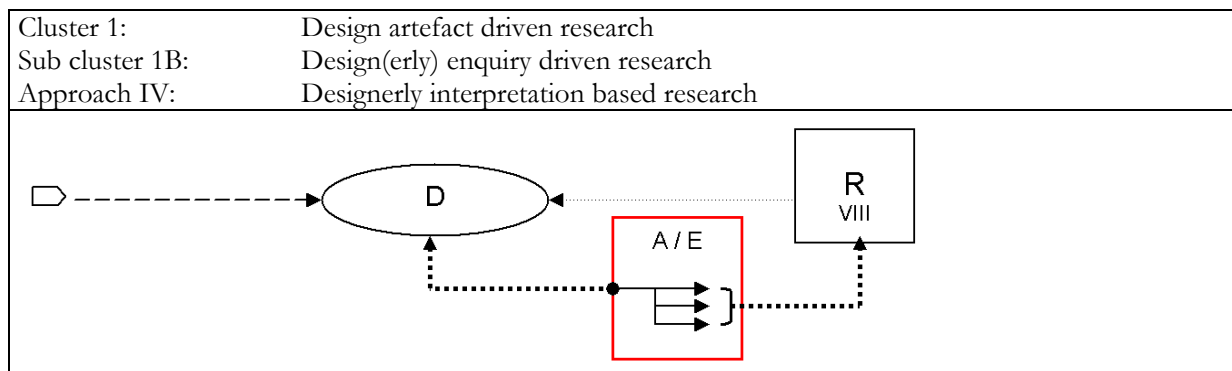


Figure 7: Scheme of Type IV: designery interpretation based research.

Designery interpretation exercises provide opportunities for the bringing together of research ambitions on the one hand and the kind of design expertise, which is present in the profession (and to a certain extent in the design education environment) on the other. The underlying motives and ambitions of such research initiatives may be to discover more about specific design artefacts, but potentially also to gain insights concerning the ‘science of design’ (which does not necessarily imply considering design as a science).

Such research, involving *designery interpretation* also calls for a ‘detective’ attitude and as such there are parallels with type III. However, in this type of study the researcher generally has less information to ‘go’ on. Such a lack of ‘clues’ means that clues need to be constructed, allowing for design considerations to be played back and forth in a kind of ‘mental experiment.’

The researcher may take a ‘design perspective,’ using designery modes of *enquiry* to ‘get under the skin’ of the design project. In such a way the researcher (or designers invited to take part in a controlled research experiment) can generate ‘simulated’ design options, in order to identify and clarify aspects of real design results. Such designery variations may be developed and compared with the actual result in a relatively systematic way in interpretative ‘cycles’ involving: designery orientation, variation, evaluation and explication. For this to be possible a methodical framework needs to be constructed beforehand and the design aspects that are to be addressed need to be identified and defined in a consistent way. As with the previously mentioned examples of result-driven research, such interpretative projects generally do not start ‘from scratch.’ The basis may consist of one or more design precedents, which will be explored using the working methods of designers but within a methodically transparent research ‘construct.’ Such an approach does not have to stand on its own. Combinations are conceivable, such as with type II (by taking a group of design results as a starting point via cross-referencing and comparison) or with type III (by combining existing information with ‘constructed’ information. More ‘players’

can be involved, as in type VIII. In addition, different combinations of design media can be used and tested in the course of such an undertaking.

Such research is primarily explorative - and will often be carried out in combination with methods mentioned earlier - but empirical research on the basis of *hypotheses* is conceivable. Although this approach is still relatively speculative, it may help bridge the gap between empirical approaches of study and the expertise, which is present in design practice and education.

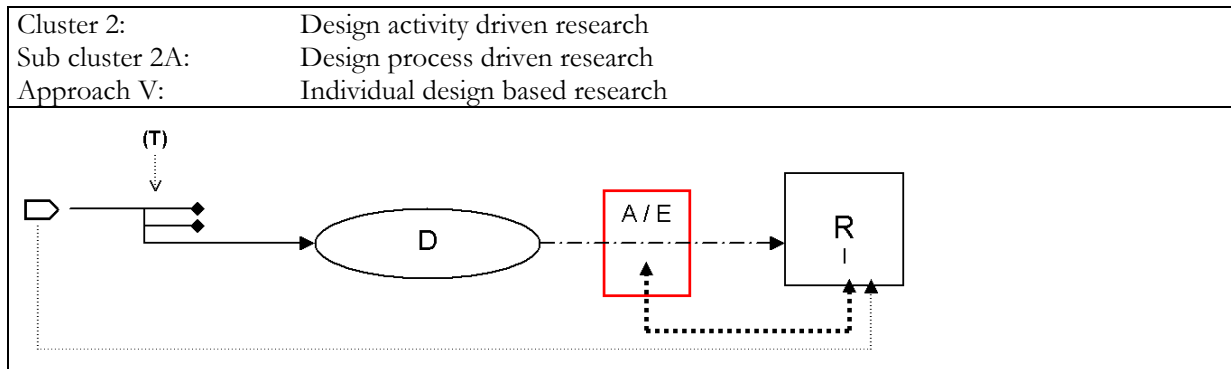


Figure 8: Scheme of Type V: individual design based research.

In principle, the initiative for this type of study lies with an individual designer or design team. Usually this means that issues and outcomes of one or more the design processes are collected and documented conscientiously, for the benefit of elucidation – and potentially publication – at a later date. Design sketches and development models, interim options and definitive drawings, as well as photographs of the results may be used to illustrate and communicate the intentions and qualities final product and place it in a broader perspective.

Such a process is usually triggered by *practice*. The basic intention of the designer is to draw up plans that will be realised. Simultaneously there is a kind of ‘self-monitoring’ discipline in view of the imagined scientific potential. Such an approach runs the serious risk of a lack of objectivity. If the designer – who is at the same time playing the role of designer and researcher (sometimes supported by a ‘ghost-writer’) - is not able to keep sufficient ‘distance,’ there is a danger that ‘theory’ is confused with private conviction or design doctrine. In some cases the results amount to an indiscriminate promotion of personal conventions and fascinations. Without sufficient critical consideration, the result may resemble architectural office documentation rather than a serious research product. In recent years there has been a steady outpour of glossy monographs, frequently initiated and sponsored by the offices themselves.

Nonetheless, such approaches can be valuable, because they offer insights into the domain of design decision-making and can often play a meaningful role in design education. Examples of such design centred studies, in which design activity is consciously used as a vehicle and reference point for broader design reflections can be found in the work of design practitioners, such as Hertzberger (1993; 2000), Hoogstad, de Haan and Haagsma (1990), and Holl (1996; 2000) and, to a certain extent, the publications of ‘think-tank’ offices like UN Studio, OMA and MVRDV.

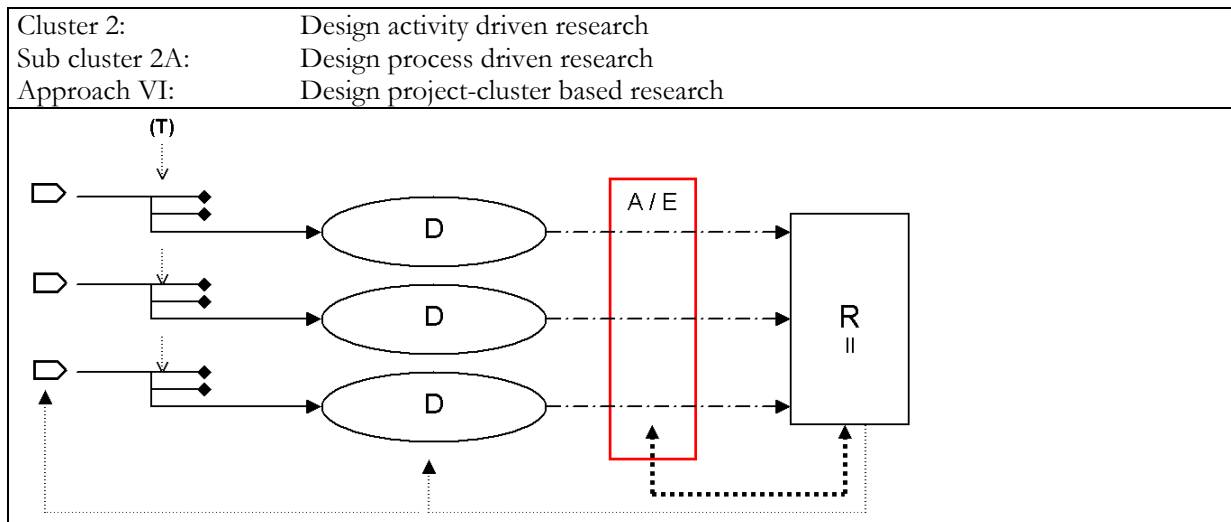


Figure 9: Scheme of Type VI: design project-cluster based research.

Design projects involving a *collection* of designers can potentially also form the basis for design research. Such collective activities, with a set of predetermined guidelines concerning context, programme and task can lead to a variety results. In principle, these can nonetheless be compared relatively systematically if pre-determined; binding themes have been specified beforehand.

Examples of such initiatives are systematic analyses of professional design competitions, but also thematically clustered design projects in an educational setting, such as groups of diploma projects with a collective theme and comparable context.

Frequently, the design results that come out of such projects are considered to be an integral part of the research output. In some cases, all of the resulting projects are indiscriminately included in project publications, regardless of their relative qualities. For such projects to do justice to their research ambitions there has to some form of rigorous scrutiny and assessment of qualities, preferably on the basis of systematic comparison. One way of doing this is by involving peer groups of qualified researchers or a professional jury.

Projects of this sort all too frequently tend to focus on the undertaking as a whole and to highlight particular themes and cultural developments, rather than offering an objective analysis of the outcomes. The clearer the 'format' of the exercise, the more methodical such an evaluation can in principle become. In many cases the research outcomes are predominantly descriptive. However, if the ambitions and expectations concerning what it is that the projects which are considered are intended to address are specified clearly beforehand, such an approach can become explorative research and potentially even – hypothesis based – empirical research.

An example of such a research ambition was the 'Architectonic Intervention' programme, a series of design studies – based on a number of thematic diploma project clusters – at the TU Delft Architecture faculty. For a summary of the programme and its results, see Klaassen (2001).

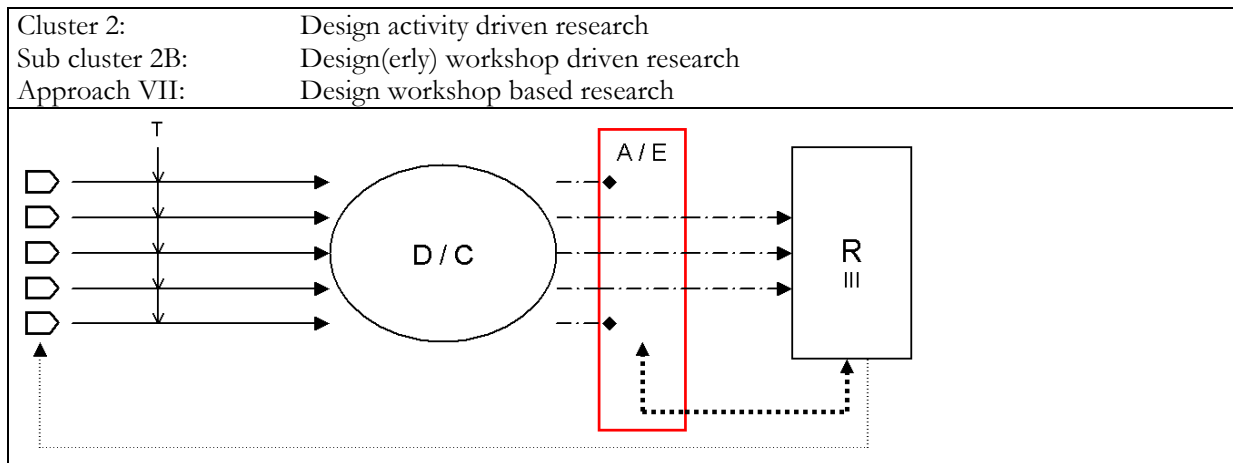


Figure 10: Scheme of Type VII: design workshop based research.

There are distinct similarities between design *workshop* based research discussed here and type VI. However, whilst in this case the design (education) process also plays an important role, the evaluation selection of data has more prominence.

In this context ‘workshop’ indicates a collective project whereby there is more than a loosely binding theme; it means that all participants are set precisely the same task. In the methodological design of such a workshop project, clearly defined rules are set beforehand. There is a clear programme (indicating what is, and what is not expected) and there are conscious limitations concerning the complexity of the task (constraints). The idea behind such a set-up is that by reducing the scope of study, the design work may attain a certain depth, rather than width. In addition, the assumption is that by setting all participants an identical task, the results should in principle become better comparable.

The experience with such projects indicates that such an approach does not lead to identical results, but on the contrary, to a wide range of varied results. From such a collection of design study results, insights may be gathered concerning relevant design themes, recurring motives and the effects of structural and compositional variation.

In this case the (academic) design environment is used to learn more about design attitudes and methods. The procedure is primarily explorative. Design products are not considered as research products (except of course in the light of the individual designerly research of the participants and their learning processes), but as a collection of artefacts, which can be analysed and compared with each other (and with other design precedents) for the benefit of research. The role of the initiators is simultaneously on of ‘curators’ of the project’s creative output and the analysis and presentation of results.

Examples of design-driven projects in an educational setting are Form and Media Studies workshops (and subsequent exhibitions and publications) organised in recent years at the TU Delft Architecture faculty in recent years (Breen and Olsthoorn 1993; 1996; 1999; 2002; Breen 1998).

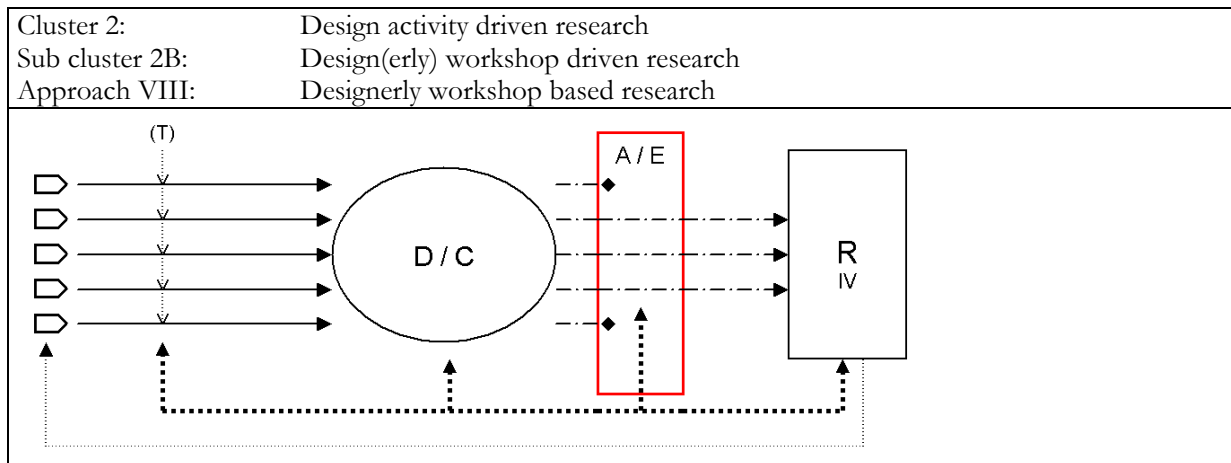


Figure 11: Scheme of Type VIII: designery workshop based research.

In *designery* workshop projects the methods indicated in type VII are taken a step further. In this case it not a matter of learning about compositional qualities of designs afterwards, but to target particular issues of interest and *infuse* these into research projects involving active designery enquiry by the participants, closely monitored by the researcher(s).

Such a workshop –based study requires that the project is set up conscientiously as an experiment, by creating a simulated working environment. Initially – in a pilot study – the tasks may be formulated relatively loosely, in order to explore procedures and gather information. However, the experimental exercise benefits from a more strictly organised research ‘construct.’ The empirical potentials of such a study will be highest if there are clearly defined expectations, laid down in working hypotheses, which can subsequently be tested within the workshop ‘environment.’ Such a ‘game’ situation with preconceived rules, constraints and formats tends to prove beneficial for objective study, creating a platform for systematic comparison of (intermediate) results and in-depth analyses. The working process can in principle be monitored in different stages of the project’s development.

This type of experimental approach may target compositional themes, but may also focus on more methodical issues, such as the influence of different (combinations of) design media.

In principle, such an approach involves setting design tasks, but could in principle also involve group driven designery studies, as indicated in type IV.

In the context of the Dynamic Perspective research project, the Delft Media Group has been working on ways to develop this type of workshop based empirical research further. Examples of pilot studies are the *Imag(in)ing* study (Does and Giró 1999) and the *Imaging Imagination* EAEA conference workshop (Breen and Stellingwerff 1998; Breen 2004). A recent example of a targeted design media experiment, involving closely monitored designery activity, was the project entitled *Virtual Context*, a PhD study carried out by Martijn Stellingwerff (2005).

8. Perspectives

If we wish to extend the range of design oriented research, then other methods have to be found - or developed - which do justice to the kind creative *variation* that is a characteristic of architectural design. New opportunities for innovative and imaginative design research may be offered by integrating active forms of *designerly enquiry* into education and research. Design-driven working methods offer new opportunities for architectural and environmental design research. The experiences with design-driven exercises in an educational setting and explorative workshop projects, which have been mentioned, indicate that design-driven trajectories deserve to be explored and pursued further. In this context, the methodological component of design-driven research projects should not be underestimated. If results are to stand up to scrutiny by researchers from other disciplines, 'research by design' projects will need to be logically and transparently constructed, as well as clearly and consistently reported.

This exploration of approaches is one of the outcomes of the *Dynamic Perspective* research project (1998 – 2003). These insights are being made instrumental and developed further in the course of the current research programme: *Form and Media Studies*, as part of the Delft faculty of Architecture's Context and Modernity research programme (2003 – 2008). This programme includes four explicitly correlated research topics: Analysis and Development of Theories; Composition and Variation; Production and Visualisation and Experimental Studies.

The typological framework put forward in this contribution, was conceived as a way of creating insight and clarity concerning the aims, media and methods of design driven studies in the context of architectural research. This collection of eight approaches is intended as integral framework of reference. It replaces a typology with six categories, which was evolved and tested earlier on (Breen 2002b).

It has been a conscious choice to, at least for the time being, focus on examples of design-based studies carried out previously at the Delft faculty of Architecture. A next step will be to investigate to what extent the framework may prove to be applicable to other architectural design studies – and potentially to *other* design driven domains of enquiry. It is hoped that researchers of design will feel challenged to make creative and critical use of this 'vocabulary' when developing their own *designs* for imaginative and innovative research projects.