Chapter 8. Design Thesis – Case oriented Research

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Abstract: C.H. Doevendans, K. Steemers, J. Verbeke, J.L. Zamora I Mestre 2003. Design Thesis – Case oriented Research. USO-Built Report Series 2:61-64. Quality criteria for an academic design thesis (MPhil and Doctorate-level), and other academic design output are formulated. Research in the program is executed by the research-oriented disciplines of the department from the domains of the humanities, the engineering, natural, and social sciences. The research includes the design-relevance that can be attained by the so-called Research-by-Design-approach. Originally the 'Research by Design'-assumption led to the idea that Doctor-theses in Architecture should be mainly consisting of actual design. However, the policy of the USO-Built group has gradually changed. Although design could be part of theses towards a Doctor degree, Design Thesis should meet the requirements of a regular Doctorate Thesis.

Keywords: research by design; research in the humanities; knowledge through action
Architecture students should be encouraged to think of their design work in terms of a research process. There are many reasons for this, including:

(i) Students are in an academic institution, where academic rigour is expected;
(ii) Students will become more conscious of the decision-making process, and thus able to develop their strengths and their own methodologies that suit them best;
(iii) Students should become better at explaining and substantiating their design proposals. Clearly some students have an intuitive ability, but even their work should be supported by clarity of thinking;
(iv) The presupposition especially proclaimed in architecture and urban design-disciplines, that a design could be a means to develop scientific knowledge.

Related to (iv) we noticed that architectural institutes propagate the necessity of a research-climate for their students (http://www.avocaad.org/research/statement.html). In research programs the idea of a Design Thesis as similar to a Research Thesis (both leading to a Doctorate-degree) is introduced.

A complicating factor may be the unbalance between implicit and explicit knowledge in Architecture (Chapter 5) and the resulting practice of knowledge as a tool for knowing, and of knowing as action

This chapter concerns the following issues (i) How to implement a design thesis of high academic quality; (ii) Seeking connections with industry, especially professional bodies of architects, urbanist, other building professionals, also international organizations as ACE and ECTP, and educational organizations, like EAAE and AESOP, and together influence national and European research agenda’s to fund research work on built environments.

8.1. Academic Criteria
The Association of Cooperating Netherlands Universities (VSNU) has given a definition of a design thesis of high quality. Such a thesis embodies a design that (i) has been accomplished in a scientifically valid way, (ii) using appropriate discipline-specific theoretical knowledge and methodology, (iii) made use of existing (raw) materials and components, to be processed and / or assembled, (iv) has the whole documented, (v) is able to perform a new independent function in technology or society, (vi) is the result of a certain minimum workload, and (vii) has generated scientific output. A discussion on the nature of design falls outside this scope of quality assessment.

Below the VSNU-criteria are detailed and commented on. Also some specific Output Criteria are defined. Publication of results is needed to allow a scrutiny of quality by peers, the approval authority in research.

Finally, The discussion regarding design theory and methodology, the (dis)similarity of design and research, the assumptions 'Research by Design' and the 'Research as a form of Design' etc. are delicate as well ramified subjects (Chapter 5).

CRITERION 1: SCIENTIFICALLY VALID. Accomplishing a thesis in a scientifically valid way includes a clear description of the (type of) design-strategies, the process in terms of phases, the assumptions made, the problem and goal of the process, the situation and context of stakeholders.

When relevant, at least a clear description of the concept of which the final design, project, plan or construction is the realisation, the concept that represents the essential assumptions, values, idea's etc, to be seen as the equivalent of a scientific hypothesis.

**CRITERION 2: THEORETICAL KNOWLEDGE AND METHODOLOGY.** Architecture as a phenomenon of our material and spiritual culture forms the object of a diverse range of theoretical approaches and studies. Hereby, researchers use a multitude of methodologies. Approaches and studies can start from a contemplative, reflective, thematic, empirical, analytical or synthetic approach. Much of design research can also be categorized as 'philosophical', meaning holistic, complex, integrated, value-laden, inventive, user-responsive, etc. It is clear, that a reductionism approach as associated with 'scientific research', might result in the narrowing of research topics from 'design' to very specific subtopics making the notion of a Design Thesis inappropriate. Nevertheless, scientific rigour and appropriate discipline-specific theoretical knowledge and methodology are needed to describe selected fields of knowledge and methods, relevant for the design, with a focus on the knowledge and methods of the specific discipline of which the design is part of, including a description or overview of relevant international scientific and technological literature.

**CRITERION 3: EXISTING MATERIALS AND COMPONENTS.** Since a design makes use of existing (raw) materials or components to be processed or assembled, an overview of such materials and components are needed. Also the processing of these materials and components, and the way of assemblage are to be described. Materials and components are seen as design-elements. This means a broad definition: typologies of buildings, public space, facilities, functions, etc.

**CRITERION 4: DOCUMENTATION OF THE WHOLE.** The documentation of the design may be performed in drawings, written text etc., leading to a published book or journal contribution that is bibliographically accessible, and thus bear an ISBN or ISSN number.

**CRITERION 5: NEW INDEPENDENT FUNCTION.** A design of an acceptable quality performs a new and independent function in technology or society. This means that reflection on the meaning of the design for technology or society is obvious and proven, also in comparison to existing designs. The design is seen as an adequate solution for a problem in a situation and relevant stakeholders-context (functional dimension), or as a cultural statement (intentional dimension), or as a strategy for design, development or management of the environment. In all cases this includes a comparison with alternative designs, existing or developed as part of the design process.

**CRITERION 6: WORKLOAD OF A DESIGN.** 50-60% of the time period the student spent on the Design Thesis allows for the actual design, while the other 50-40% is spent on documentation, description, reflection, literature search and writing the thesis. Some universities use amount of words as indicator for the time spent on subjects. Also the difference between the MPhil-level and Doctorate thesis is also expressed in their length as measured in words. Typically a MPhil level thesis has a size of up to 20,000 words, while the Doctorate thesis is longer: up to 80,000 words. The number of words may be more limited when a full-grown design is part the thesis output. Some member universities may need some time to make to replace (parts of) these word counts with a design submission.

**CRITERION 7: GENERATING OUTPUT.** The design process leads to various output categories not unlike those of a ‘Research Thesis’ in the domain of the humanities.
The following categories are considered as academic output. The emphasis in this output is on research process, methodological grounding, and reference to other research-outcomes; aim is the growth of knowledge, and the audience are fellow-researchers:

(i) Thesis for a degree of doctor or MPhil level degree;
(ii) Publications meant for the community of researchers, usually publications in (peer-reviewed) periodicals or published peer-reviewed papers at international congresses or workshops, or (chapters in) academic books;
(iii) Patents Granted by a recognized (inter)national body.

Other output exists with a high societal value, but that is not considered academic since their audience are not fellow-researchers. This includes:

(i) Professional publications meant for the community of professionals (emphasis on the application of research-outcomes in professional contexts, linking-up with professional languages and experience; aim is the spread of knowledge);
(ii) Other publications to educate interested citizens (in newspapers, magazines, encyclopaedias, etc.)

8.2. Design Thesis
Publications of each mentioned category are produced as part of the research-task of universities, and earmarked as such. Good interrelationships with professional bodies and industry will foster both academic research and relevance for practice. Designs may be placed in any of the categories, as long as the requirements of that category have been satisfied. However, It is clear that a design can only lead to a Design Thesis when and if it is published for the community of researchers. On the other hand, designs are often developed in the professional practice of designers. In principle these designs cannot be considered as academic output, since their development has not been part of the research-task of universities.

Nevertheless, in the case of a part time-member of university staff, the interactions among professional practice, scientific-research, and educational tasks cannot be denied. Exceptions to the academic rule (but not the academic level) should be possible, to be judged by (the coordinators of) a research unit (IRU) of USO-Built.

8.3. Designer’s Design
Often design are described and reflected on by other researchers. The design then is published not by the designer, but by another author. If the article gives a substantial description, analysis and reflection on the meaning of the design or designer for profession or discipline and is published in a peer-reviewed publication for fellow-researchers, the output can be added to the research output list of the IRU in a new category ‘Refereed Designs’.

8.4. Competitions & Contests
Finally, the participation of designers in competitions and contests should be addressed. A prize winning design can be considered to be a publication in the academic or professional category, dependent of the type of competition or contest, the composition of the jury, and the way of publishing the jury’s report.