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INTRODUCING RESEARCH IN ARCHITECTURAL DESIGN TEACHING AS A MEANS TO ENHANCE THE DESIGN LEARNING PROCESS

Karel VANDENHENDE
KULeuven, Belgium

ABSTRACT
What is important in architectural education? On the one hand, students learn about architecture itself; about designed buildings and surroundings. And on the other hand, they learn how to design architecture. The latter being the study of the process, while the first is the study of the product as a result of that process.
A literature review of the design process brings up that being process-oriented, and not product-driven, is one of the most important skills while designing. But architecture students are also very interested in designed architecture as a result, as a product. So focusing on the process while forgetting the end product of it, seems a very difficult skill to develop.
Integrating the design in a research project can counter this problem. Besides other advantages, like for example positioning the standpoint and the design of each student in a larger frame, the incorporation of the assignment in research also changes the true nature of the project. In fact, the focus shifts from solving a problem to doing research, and at the same time it alters from solution to process.
In a specific case, we redefined an assignment for first year architecture students for a 'townhouse' and changed it into a 'research on dense urban living'. The purposes of the new assignment, and at the same time the resulting documents, do not concentrate on a designed house as a result, but they focus on the student's research as part of a larger investigation of 'urban living'.

Keywords: Research, design process, teaching, architecture.

1 INTRODUCTION AND MOTIVATION

1.1 Introduction and motivation

Architectural education can be analysed in several ways. One way is that you consider architectural education as consisting of architecture on the one hand, and architectural design on the other. The latter being the study of the process, while the first is the study of the product as a result of that process.
A lot of theory about architectural education emphasises that during the design process, designers should be more concerned about the design process than the design outcome. Frederick Matthew [1] states that being process-oriented, and not product-driven, is one of the most important skills in architectural design. Among Ochsner [2], the overall focus of design education is clearly the internalisation of the design process itself. He states that it is not the problems themselves or the solutions alone that are the aim of design education. Rather the aim is learning a personal process of design - a way of thinking about making architecture. Lawson [3] confirms the importance of the process with a metaphor: not just the skill to juggle is needed, but also the judgement of which set of balls to pick up and when.
But this focus on the process instead of the product is not easy, considering that architecture students are also very interested in architecture itself, being mostly the main reason for choosing an education in architecture. Moreover, the focus on the end result is reinforced by the fact that the design process in itself is solution-oriented, meaning that the nature of the problem can only be found by examining it through proposed solutions [4].

And also, in most studio's, mainly the end product is evaluated, sometimes even with an external jury who didn't follow the process at all, thereby moving the focus even more to the end product, All these factors stimulate students to skip real thoroughly investigation of alternatives in favour of a finished product.
So focussing on the process while forgetting the solution or end product of it, seems a very difficult skill to develop. How can we anticipate to this difficulty? Let us therefore investigate the through nature of the process.

1.2 Approach

We will begin this paper with a literature review of previous research on the design process. In this section, we will find out that searching and research are key features of that process. With that theoretical frame in mind, we changed a classical studio assignment and asked students to introduce in an explicit way research in their design process.

2 THE (RE-)SEARCH AS A KEY FEATURE OF THE DESIGN PROCESS

2.1 The design process as a sequence; as a series of searches

Takeda and others [5] describe the design process as a repeated sequence of problem formulation, suggestion, development, evaluation and conclusion. Cross [6] describes 4 essential activities during the design process: exploration; generation; evaluation; communication. IDEO [7] describes 5 phases: discovery, interpretation, ideation, experimentation and evolution. The process of
human-Centered Design developed by IDEO goes through three main phases: hear, create, and deliver. All these models have in common that they describe the design process as a sequence; as a series of searches; or, as Neutelings [8] formulates it; as a quest, a journey of discovery without a map, where only the port of departure is known. And this cycle of searches is repeated until a satisfactory solution is found.
Now this is where research by studio design comes into play because, by definition, research is about searching and thereby, it can help students to focus on the process, as a cycle of searches, in favour of the design product.
So being process-oriented means on the one hand trying to understand what to do when and why, but it surely also means being search-oriented. Or, according to Matthew [1], it means that you know when to change and when to stick with previous decisions, but it also means that you seek to understand a design problem before chasing after solutions.
In fact, also in a literal way, the words 'design' on the one hand, and 'research' on the other, bring along with them a difference in focus. The word 'design' is not only used for the process, but it is also being used for the end product. While on the other hand, the word 'research' contains in itself already the word 'search'.

2.2 Hurried and slow designers

The focus on the search means that the designer must take time to search, to ask questions, to examine alternatives, to investigate all constraints, instead of running in a straight line to a solution. He must take his time to love his experiments [9]. Being slow to fall in love with his ideas. A good project is made slowly. Today it is more essential than ever to insist on having that time for the design process. The architect needs this time not so much for the design production, but for the analysis and subtle balance of all the facets of the social, functional, environmental, economic and contextual problematic of the project. Every commission needs ideas to bring it to life and ideas take time to ripen. A good architect works slowly [10].

2.3 Design process versus design product

Shifting from the end product to the search-process, brings along some other advantages linked with research. Defining a project as a research will position each design project in a larger frame. Framing at the start of the research offers a context and an intention. Framing at the end offers comparisons between different results.
But besides offering a larger context for the design research, it also changes the relations between teacher and student in a design studio in a positive way. The relation between teacher and student shifts from the knowing teacher and the not knowing student to a collaboration between both; from the

teacher who demonstrates and the student who repeats to both suggesting and developing, from an active teacher and a passive student to both being active. And more specifically, the student shifts from being non-critical tot critical; from just answering to also questioning things. And the process shifts from teaching to learning. Educational psychology emphasises the importance of learning over teaching [11]. This shift from passive to active reinforces the learning, following John Dewey's argument that children must be engaged in an active quest for learning [12]. Just having an experience does not necessarily mean that learning has occurred. The important factor in turning experience into learning is reflection [13]. The model of the student as an empty vessel is thereby criticised. In this model, the teacher is to fill the student with knowledge, while the student has to acquire the desires of the teacher, and display that knowledge back to the teacher, unchanged by the students own thinking, desires and ways of knowing. In contrast to the student being 'filled' with knowledge, a dialogic exchange between student and teacher which values both party's prior knowledge and experience, will lead to knowledge being produced. The student teacher relationship becomes one of mutual exchange and collaboration [14].
The move from product to process also meets the principal goal of education. That is to create men and women who are capable of doing new things, not simply repeating what other generations have done - men and women who are creative, inventive and discoverers. The second goal of education is to form minds, which can be critical, which can verify, and not accept everything they are offered [15].

3 CASE: REDEFINITION OF AN ASSIGNMENT FOR A TOWNHOUSE AS A CASE STUDY ON URBAN LIVING

3.1 Introduction and approach

In a specific case, and as an experiment, we redefined the assignment for the first year architecture students of one design studio in the first bachelor. The question to design a ‘townhouse‘ was changed into a ‘case study - or research - on urban living’, framed by a larger context. The context of densification, explained with ‘het lelijkste land’ of Renaat Braem [16] and with some of the main intentions of the ‘ruimtelijk structuurplan vlaanderen’, was offered by the tutors as a starting point, together with a real empty plot in the city of Leuven. The students of this research-studio worked parallel with the students in the other studios in the first bachelor. In the other studios, students worked on the classical assignment of a townhouse. The purposes of the new assignment of the students in the test studio, and at the same time the resulting documents, did not concentrate on a designed house as a result, but they focused on the student’s research as part of a larger investigation of ‘urban living’.
The project was organised in a rhythm of 5 design weeks, each of them consisting of 3 design afternoons. Students worked together in a studio, whereby almost every design afternoon, a tutor passed by to review their work, individually, or in a group. At several moments during these weeks, we did not only review the student’s research, but we also interviewed them about the assignment itself, and about the redefinition of the project into a case study.

3.2 Week 1

At the start of the project the assignment was isolated from its site. We isolated the project from its real context to facilitate the focus of the students on spatial aspects of urban houses. So the students didn’t work on the available empty plot during this first week, but started to investigate qualities of spaces and places of urban houses in general [Figure 1]. A frequently recurring research involved the balance between density and spatiality, between contact with the surroundings on the one hand and privacy on the other. Individual spaces were examined separately, but also combinations and configurations of spaces were tested.

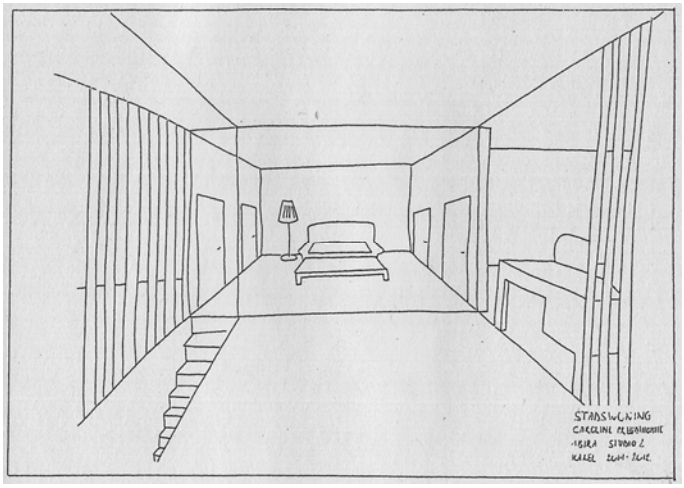

Figure 1. Investigation of spatial qualities of bedrooms and communal space around a roof terrace, by student Caroline

And from the third day on, almost parallel with this research on identities of spaces in dense areas, they started to examine needed surfaces and volumes for typical activities related with urban houses. [Figure 2]. Students were encouraged each time to test several variants, to search for alternatives, whereby the comparison between these variants made the qualities of each of them more tangible. We also asked them to give each variant a specific name, as to appoint the characteristics of this variant.

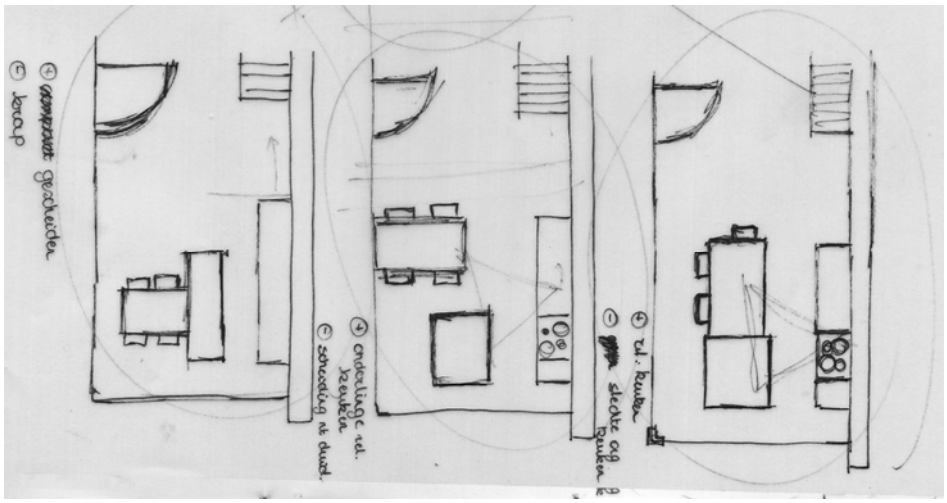

Figure 2. Variants for the activities linked with eating and cooking by student Thomas

This siteless investigation of qualities and quantities of places and spaces was continued during one week. Only after this first week, and after making several small volumetric spatial models of the conceptualised houses, these models were put together on the available plot. The plot we proposed is an empty site for row houses in the city centre of Leuven. Several combinations were investigated before choosing a specific location on this site in the row formed by the houses of all the students of the studio [Figure 3].

3.3 Week 2 to 5

In week two, students started to investigate tectonic and structural qualities of urban houses. As during the first week, several variants were tested, whereby students got already much easier in the rhythm of alternating divergent and convergent.

During the third week, they combined their research of the second week on solids with their research of the first week on voids, trying to match the different constraints, again by investigating several possible combinations of solutions [Figure 4].

Figure 3. Model of site with a row of 9 houses

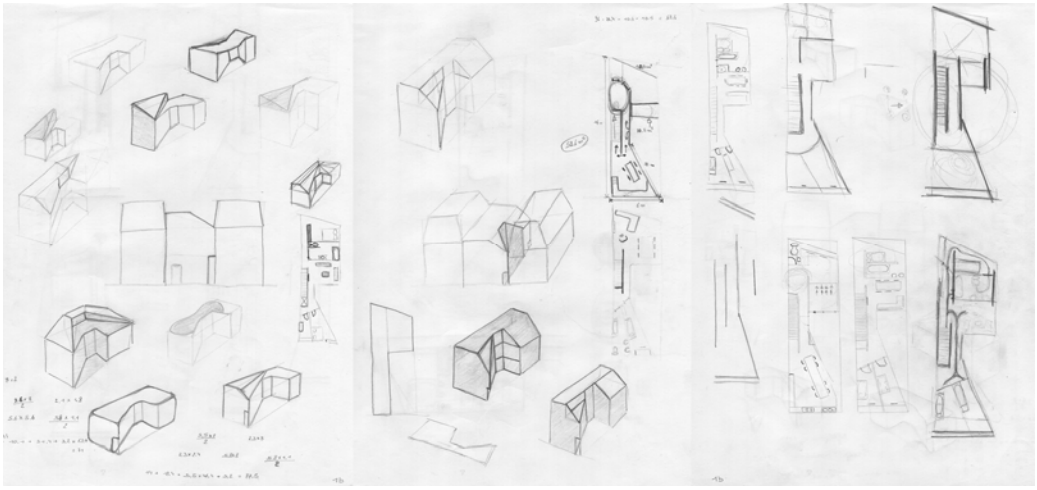

Figure 4. Matching of all design aspects by student Damiaan

In week four and five, students started to elaborate one of the possible solutions. Thereby, the assignment shifted progressively from extensive divergent research to more convergent problem solving. It shifted from testing several variants to merging the different constraints into a consistent solution. And at the same time, the assignment also shifted from research to design [Figure 5].

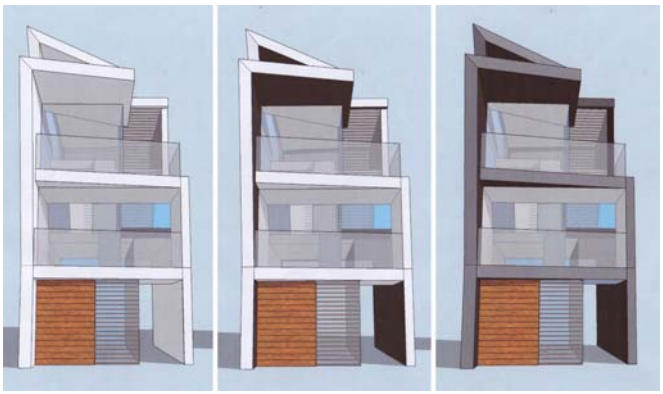

Figure 5. Testing of several variants of materialisation in interior and facade by student Thomas

4 CONCLUSION

At first sight, the design search and results seemed to be similar to that of any well done design process. And in fact they are indeed similar to that of an exemplary design process. But when we compared the results and documents of the students of the 'research-studio' with those of the other parallel 'design-studios', we could pinpoint major differences. Students of the research-studio had produced much more research documents and had examined much more variants in each phase of the process, in a much more systematic way. The definition of the assignment as a research project, that only at the end turned into a real design project, greatly helped the students to shift the focus from the final result to the design process. Previous research showed that this helps designers to get closer to such an exemplary design process. We did not adapt the project to expect groundbreaking research from students during the first year of their education, nor to let them analyse every step of their design process. But we changed the assignment as a means tot let go the focus on the end product and to get students concentrating on designing itself: the iterative process in which divergent and convergent researches alternate and in which a cycle of problem formulation, hypothesis, testing and evaluation is repeated.

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