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Embedment of Study Programs in Research

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The advantages are many when study programs are embedded in research. Some problems may, however, occur due to the differences in the nature of research and teaching. The following text addresses these problems through the descriptions of study programs at the Aarhus School of Architecture, Denmark.

Research has by nature a well defined point of departure – the hypothesis. In opposition to this, it does not have the same predefined results – the conclusion. If the conclusion was known on beforehand, there would be no research. In other words, research follows the rule: if we know where we are going, there is no need to go.

In our opinion study programs should follow the same rules. In order to stimulate the students' creative and innovative potential, study programs should have no predefined results, nor should they have a predefined road to follow: only an initiating point of departure and the supporting environment. So far research programs and study programs abide by the same rules.

The differences occur mainly in the way they zoom in on there study object. Where research is free to zoom in anyway it pleases, study programs in general have an obligation of a more broad approach. This is to ensure that the candidate has a general knowledge of the different aspects of architecture, and that he can orient himself in these aspects.

The title of the research program in which we have embedded a study program is 'industrialized individuality'.

This research program takes it point of departure in the reality of the new production methods of today.

Briefly described, previous production methods were based on craftsmanship. From an architectural perspective this resulted in designs of great variation and individuality. The 'Arts and crafts movement' resounded the essence of this production method (ill.1).



Ill.1.
Craftsmanship + individuality
(Machintosh house)

With the industrial revolution, the production method changed from craftsmanship and individuality to mass production and standardization. For the architectural design



Ill 2
Industrialization + standardization
(Mies van der Rohe, Montreal)

this change in technology led to repetition and rationality. The design components were not individually designed, but came out of standardized fabrication. Architecture lost its previous individuality and became standardized (ill.2).

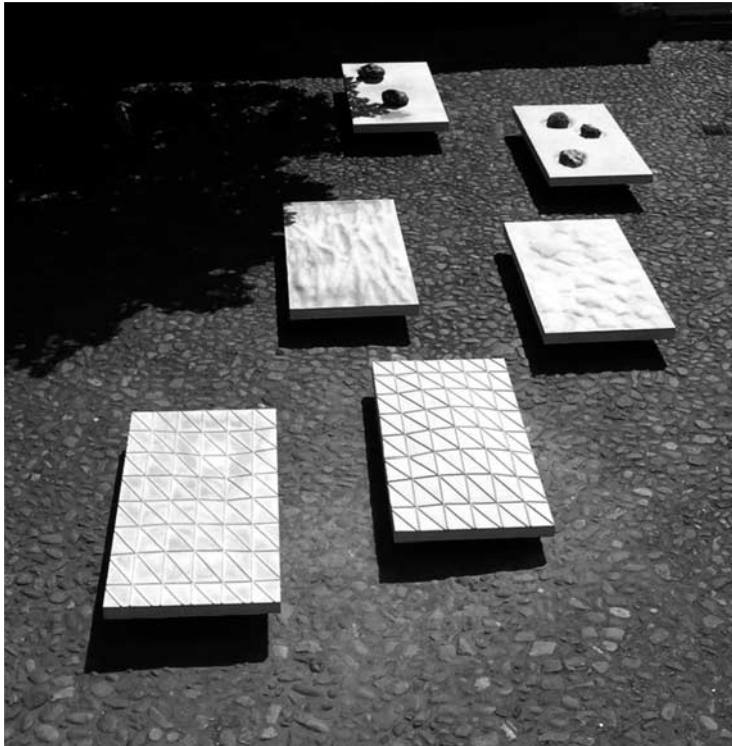
In contemporary production methods, a shift of paradigm has arisen. Due to the computer and robot technology CAD CAM, it has suddenly become possible to produce objects and building components with individual forms. This technology rapidly developed in the car industry and is today a reality in many areas of the building industry.

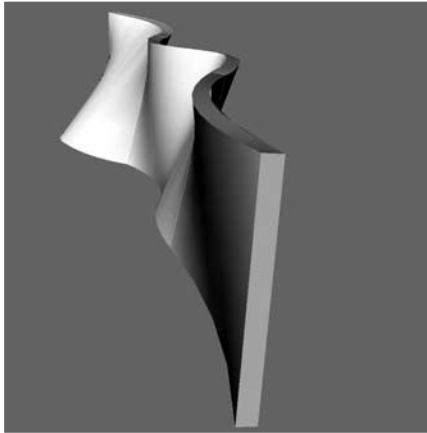
In the research program that we are involved with, we specifically focus on the technology embedded in pre-cast concrete industry.

Through a preliminary research program, it has become evident that the pre-cast concrete technology lacks the embedment of the new technology. A survey reveals that the industry is still in the era of standardized mass production, and even this does not seem to be the entire truth. What was to be expected today would be a production characterized by a large number of identical elements cast from the 'mother' mould.

The reality in numerous concrete industries is, however, that only a few elements are cast from the same mould. This requires a large number of moulds and therefore an extensive degree of craftsmanship in the production. In other words; there is to a large extent an individual production method in the pre-cast concrete industry, it is just not based on industrial techniques but mainly on craftsmanship.

From this reality arises the paradox that a lot of new buildings aesthetically radiate the era of traditional mass production, but their real production is in fact based on craftsmanship.





Ill 3-12
Industrialisation + individuality. Experiments
with industrialized mass production in precast
concrete

The aim of our research program is to develop a series of techniques for the embedment of customized mass production in the concrete industry - or to be more specific: to develop moulds that are capable of producing a large number of different elements. This requires a crossover between different technologies, and that is why our aim is primarily to demonstrate that such a technology is plausible (ill.3-12).

To embed a study program in the research program, as described above, necessitates a more broad approach to the subject in order to give the student a basic knowledge and competence. As a result we have decided to broaden the focus of the study program in such a way that it is not only concerned with the technologies related to the casting of concrete, but also to the casting of materials in general. This offers the candidates the opportunity to learn about many different casting techniques and at the same time to become familiar with the aesthetic and technical potentials of a large number of materials.

To initiate the study program, a workshop has been arranged. The aim of the workshop has been to cast a wall consisting of a number of concrete elements. On these elements a series of bronze objects has to be mounted.

As a result of the workshop the students have learned different techniques of casting. This has involved casting of bronze and plaster as well as casting of concrete. The casting of plaster has been necessary in order to make the mould that casts the final concrete elements (ill.13-17).

After the workshop, the achieved knowledge and competence have been transferred into building projects that the students have programmed themselves. This has resulted in student projects with a much higher degree of tectonic understanding and integrity. The study program has therefore been consistent in its aim: to emphasize the development of architectural projects that gives an understanding of basic relations between materials, their technical transformation, and the potential of the architectural form.

In the course of the study program, the students have constantly been informed about the progresses and results of our research program. At the same time they have had the possibility of contacting the same concrete industries that we have been in contact with. This has given the students access to a lot of knowledge that has been accumulated in these companies.

At the same time the companies have supported the students financially which, in terms of the workshop, has been essential.

In other words; the students have benefited from both our research program and the companies that we have been involved with. At the same time we have in relation to our own research program benefited from the study program in the way that it has inspired us and uncovered new ways to follow in future research programs.



Ill 13-17
Study program, workshop,
casting a concrete wall

