B Design and Research Processes

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Five main topics are introduced that have to be addressed in this competency. Next, a set of learning activities is presented that is needed for the embodiment of this competency in the TU/e ID bachelor curriculum. This set describes the minimal number of learning activities needed to reach the required level of competency development at the end of the bachelor. The chapter ends with a selection of relevant literature.

B.1 The Nature of Design
Students should get to understand what kind of activity design is, how it differs from other human activities, and which abilities one should develop to become a designer.

Students should be trained in some of the basic skills a designer needs (like: reflection, integration, achieving coherence, but also more general skills like argumentation, making value judgments, double loop learning)

B.2 The Dynamics of Design Processes
Students should be able to run their design processes efficiently and effectively, to reflect on different kinds and different ways of designing and be able to choose an appropriate design strategy for their design problems. This requires some support early on in the study, to make sure that the students don’t get too many bad habits in this, and to help them get over the worst process problems, so that they can actually get to learning the content of design.

Later on in the study the subject of processes should be revisited, so that students are be able to explicitly reflect on their processes, and develop their own way of working. They should also be aware of the many design models that exist, and be able to strategically choose methods and techniques for their projects. The latter means that they should experiment with different methods and techniques, and evaluate them on their merits.

B.3 Design in Context
Students should know what is expected from them in the context of a design agency or company, the roles designers have, and they should be aware of the stresses and strains the environment puts on a design process. They should also be able to make an explicit design project plan, for themselves and others to work in.
B.4 Research Processes

Students should, in the bachelors phase, learn the basics of the research process. They should be able to formulate a research question, set up a small study (understand the difference between exploratory research and hypothesis-testing), be able to find the relevant scientific literature and understand the structure of scientific papers...

B.5 Research and Design

Students should understand the link between research and design. At the end of the bachelors phase they should at least once have done a project in which the integration of design and research was an important issue.

B.6 Competencies

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<td>B.4 Reasoning</td>
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B.7 Literature

Design Methodology
Bucciarelli LL (1994) Designing Engineers. MIT Press, Boston
Laurel B (2003; ed.) Design research-methods and perspectives. MIT Press, Boston

Research Methodology