

Document	<b>Meta Competency B: Design and Research process</b>
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## **B Design and Research Process**

### **Competencies**

**Design Process**  
**Design Research**  
**Scientific research**  
**Process Reflection**  
**Observing and Perceiving**

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### **Background / rationale**

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### **Experts**

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### **Status**

Under revision

## B.1 Design Process

Is able to guide the design process fluently

Dimensions	Level 1	Level 2	Level 3	Level 4	Level 5

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Level description</b>	Has an awareness of rules of designing	Is capable to translate and modify discovered rules to new situations	<i>Going from level 2 to 4 a transition takes place for which the level is not definable</i>	Is able to have a strategic approach towards the process and subsequently able to create new situations instead of undergo them.	Abandons the known path of the design process and shows a personal style and identity

Observation points	Level 1	Level 2	Level 3	Level 4	Level 5
	○	○	○	○	○

## B.2 Design research

Is able to do research with the purpose to guide design.

Dimensions	Level 1	Level 2	Level 3	Level 4	Level 5

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Level description</b>	Is able to formulate questions based on the design brief.	Is able to use several techniques including literature study to do research for design.	Is able to carry out research for design and synthesize results to guide design	Evaluates research outcomes and chosen techniques to redefine the research question and propose further research.	Is able to invent new methods to perform design research knowing the aim of research

Observation points	Level 1	Level 2	Level 3	Level 4	Level 5
	○	○	○	○	○

## B.3 Scientific Research

Is able to plan and perform a research process on a scientific level

Dimensions	Level 1	Level 2	Level 3	Level 4	Level 5

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Level description</b>	Is able to cooperate in a research process under guidance of a trained researcher, performing smaller and more comprehensive parts of the research process.	Is able to define and redefine a research question, gather, structure and process information from scientific resources or well defined experiments and evaluate the value of the results under guidance of a trained researcher.	Like 2 including choosing a method from different methods and evaluating the choice of method.	Like 3 Including putting the research proposal in context of existing research and making an objective report autonomously.	Like 4 including publication in an international journal or conference.

Observation points	Level 1	Level 2	Level 3	Level 4	Level 5
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### B.3 Process reflection

Is able to reflect on the processes that occur during projects and give direction to these processes.

Dimensions	Level 1	Level 2	Level 3	Level 4	Level 5

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Level description</b>	Is aware of the fact that different processes occur during the design and research projects	Has a passive knowledge of the differences between such processes.	Is able to apply defined processes in design and research projects.	Is able to reflect on the (mis)match between processes and the context in which they take place.	Is able to influence the processes in such a way that they match the purpose of the context more fluently.

Observation points	Level 1	Level 2	Level 3	Level 4	Level 5
	○	○	○	○	○

## B.4 Observing and Perceiving

Extract propositions from empirical findings, quantitatively estimate the plausibility of these propositions, and adequately deal with the distinction ‘objective-subjective’

Dimensions	Level 1	Level 2	Level 3	Level 4	Level 5
complexity	VWO	VWO	internal publication level	internal publication level	external publication level
theoretical support	none	knowledge of terminology (no formulas)	conscious usage of theoretical concepts	conscious usage of theoretical concepts	conscious usage of theoretical concepts
instrumental dimension	unarmed senses	existing measurement device	adjustment to existing measurement device	adjustment to existing measurement device	dedicated, novel device
inclination	only when asked	only when asked	routinely	routinely	routinely

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Level description</b>	Understanding of the various modalities of perception, the ability to distinguish observations, perceptions and interpretations. Appreciation of the necessity of un-interpreted observations.	Understanding and appreciation of the need for operationalisation and clean definitions. Ability to conduct a given experiment and to reflect on the reliability of the outcome.	The relation of empiric data to models, categories and attributes. An elementary notion of sources of error in measurements. Ability to critically reflect on a given experimental setup.	Advanced skills in the design of experiments. Ability to independently set up an experiment. Ability to interpret the result of an experiment (also in terms of existing literature), including a critical analysis of the possible sources of error.	Same as 4, up to the level where new observations (experiments) are conducted that are a potential contribution to the field, such that they can lead to a scientific publication

	Level 1	Level 2	Level 3	Level 4	Level 5
<b>Observation points</b>	Describes an observation in appropriate detail, and repeats the observation whenever appropriate. Questions the accuracy of the observation, and defers from speculation – unless when formulating a hypothesis.	Prepares an observation, among other things by setting up appropriate definitions of the phenomenon to observe. Formulates the purpose(s) of the observation. Relates the observation instrument to these definitions and the purposes.	Argues about the variables, their scale, and governing model(s), relevant in a measurement. When asked, consciously considers several variations of the experiment that leads to the measurement, and applies trade-offs between simplicity, accuracy, and relevance. Gives an estimate of the certainty of the experimental outcomes.	Independently designs an experiment, including justified choice of hypothesis, justified choice of a model, justified choice of (a) governing theory (theories), justified choice of measurement devices, and justified choice of means for verification.	Writes an article on a designed and conducted experiment that could be submitted to a scientific journal or a conference and that stands a fair chance of acceptance.