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When do you (or your discipline group) typically use esquisse for assessment, at what level and what type of work do you assess using esquisse?

'Esquisse' is a French word that translates into the English word 'sketch'. At the School of Industrial Design Engineering, Delft University of Technology (DUT IDE), we approach the notion esquisse through its original meaning and engage students in sketching exercises aimed to enhance their understanding of design, engagement and representation. This is based on the understanding that sketching is an aid to representing problems into dimensional, topological and geometric relationships. Through the use of study drawings, students are taught how to conduct an internal graphic dialogue about the design issues at hand. Sketches appear to be critical for adjusting and refining ideas, generating concepts and assisting problem solving (Do, Neima & Zimring 2000), and through sketching students are taught how to use mental imagery to manipulate shapes and forms and recombine them in meaningful—even creative—ways.

The way drawing and sketching is taught will be different at different design schools depending on the philosophy about what role it plays in designing. DUT IDE came originally from the architecture tradition dominated by drawing from observation and technical documentation. This kind of optimal solution drawing has been replaced by drawing that serves the design process with a focus on the ideation phase rather than on the presentation phase. In this phase, the students are asked to create mental ideas that they need to make visible through sketches. Moreover, the students want to be surprised: 'I make something associative and that reminds me of...', a mental process that is supported by drawing. The sketches become pre-presentations, a preview of possible solutions that do not bear any proof of technical feasibility. In this way, sketching becomes an excellent way to quickly explore concepts that saves the students time before they start working digitally.

Whereas many schools emphasise skills in figure drawing, at DUT IDE there is no such training due to limited time and budget. Enhancing the

students' skills in expressing human-product interaction is, however, an important part of the product design program. In order to foster this skill, students use images of, for example, a hand or legs, to express the interactive nature of the design. Drawing the object is the central objective of the exercise but the human body, or parts of it, should be there as background information (e.g. a hand holding a knife or a person riding a bicycle).

At DUT IDE, sketching classes are partly integrated in the design studio projects in the first year of the Bachelor degree. There are separate classes for sketching parallel to the design course. In the semester system with 2 periods of 10 weeks each per semester, the parallel courses run during the periods 1 and 3. What the students learn in the sketching class will be directly applied in the project that they work on in the studio. In the drawing class, no more than 24 students are trained in sketching at the same time, making a very personal approach possible. Students are required to work on weekly drawing assignments, which will develop different skills such as side view sketches, perspective, shading etc. In the design course, instead of giving a very limited time span of a few hours for the esquisse in which sketches have to be delivered with disciplined intensity, students are asked to deliver their drawings in sequential steps in the conceptual phase of the design process. This conceptual phase takes a few weeks.

The following steps in the design project course ask for specific drawings:

- *Design ideas* for concept design: through sketches students generate ideas, learn to 'look' and to judge, make variants and get a sense of proportion. They include the sketches in their design decisions. This stage is characterised by a kind of visual brainstorming and they generate ideas without a value judgment.

- *Observation exercise*: the students make side view sketches on canson paper, for example the drawing of a plug. They make use of colour pencils white and black, studying light and shading. At this step they introduce the human figure (or part of it) in the drawing (see the aforementioned method of the use of underlays based on existing images).

- *Folding*: students make sketches of actions, logical sequence, meaning of additions (arrows, perspective, tone, shadow).

- *Product concepts*: students have to draw side views of the concept chosen, with special attention to shadow and colour.

- *'Exploded view'*: in order to train students in this kind of spatial sketching students make an exploded view of an existing product (for example a MP3 player), including suggestions for the type of material. The sketches will be made on coloured paper, and the students give rules of how to 'read' the drawings.

- *Presentation drawings (renderings)* of the concept: the students deliver drawings that are meant to communicate to the client. The drawings include scale elements by relating them to the human size and perception.

While the connection between courses in drawing and designing is very explicit in the first undergraduate year, in the subsequent years drawing and sketching continue to be essential in the design studio. However, undergraduate classes in hand drawing finish after the first year; they come back in the master degree course with a broader view on presentation and communication.

What assessment support tools and/or enablers support the assessment, and how do these support quality assessment?

Students have to deliver their sketches for both the drawing course and the design course. The criteria on which they are assessed are:

- clarity, validity and technicality – are students able to make an image that other people can understand? Is it valid, can they defend it? What about the technical and aesthetic qualities?;

- decomposition – the ability to decompose processes;

- communication – the ability to communicate with images at several levels—are the first sketches already suitable for information transfer? Do they show the functionality of the object? What about the feasibility in technical respect?;

- development – when students make a series of 'thought' sketches, does anything happen? Is there any development or progress?;

- professionalism – the ability to sketch on a professional level in advanced concept design; and,

- creative skill – the ability to design for the future.

What feedback do students receive?

Skill training and application in a real design setting are going hand in hand. It means that students are closely followed in their skill development and they get immediate feedback from their teaching staff on their results, which also serves as a type of formative assessment.

How does esquisse support the students' immediate and long-term learning?

In short, the esquisse and learning to sketch by hand is important for several reasons:

- It teaches students about their body of thought, something that cannot be captured by digital drawing. The pure expression of self is within the primacy of a scribble, be it done by a pencil, a pen, a fineliner or a sharp object. Whether in the Stone Age or nowadays, there is no difference in method. Learning how to sketch and trusting ones instinctual sketching provides the students with a fast and easy tool that they can use in any setting; there is no obstacle, it is not an exclusive manner of communicating and it has a personal impact. Even through a less than perfect sketch people understand what you mean.

- It teaches the students how to look, to observe. Through the esquisse, the students have to understand that a complex product can be captured by basic forms/shapes: a block, a disk and a circle. They are taught how to analyse an object by looking through the complexity of it and to decompose it in those basic forms, something that gives the students insight in the essence of the object itself. By way of transparent drawing, by way of drawing lines at the backside of the object that is normally not visible, the students get an understanding of the object's volume, thus satisfying the need in professional practice to make intersections. It evokes the curiosity of what that volume contains. The viewpoint one chooses is decisive for the information transfer of a drawing.

- It teaches the students how to think in an associative way and to be open for surprises as to what appears in front of them.

How does the esquisse support, encourage or enable creativity?

The relationship between idea generation and sketching is evident since it is one of the means to achieve it. As van der Lugt (2001: 49) states: through sketching it is possible to stimulate a re-interpretive cycle of the idea generation process either in the mode of thinking—moving from general descriptions to specific depiction—or in the mode of talking—communicating your ideas in order to stimulate development and allow re-interpretation of earlier ideas that can lead to a better-integrated idea generation process. Goldschmidt (2006) states on the basis of her research that, particularly for proficient users, sketching can lead to more creative results. This advantage might result from the self-generated sketches becoming displays that are particularly rich in useful cues. Visual displays in the work environment act as stimuli and possibly as prompts in design problem solving. However, as I have found through my research on creativity (Christiaans 2002), although sketching can be a facilitator in idea generation, it is not the only tool, neither does it work for every designer.

In the way sketching is part of the DUT IDE training program, creativity stimulation is not an explicit purpose. Sketching and drawing are seen as tools to communicate about processes and solutions. Creativity is, therefore, no assessment criterion. This might be different for art schools where students are trained to learn about themselves: what is my position; does it fit me; how can I express my feelings; can I design products that are very close to my heart? Drawing has to contribute to that self-growth and to the development of one's own personal style. Whereas, in the arts where they explore the expression of the self and all sketching training is focused on developing creativity, at DUT IDE sketching aims to communicate process and product, and creativity is, thus, not a structuring element.