

A personal matter? An investigation of students' design process experiences when using a heuristic or a systematic method



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Methods are used to teach students how to design. However, what exactly students learn from method teaching has been placed into question. This challenges design educators to rethink the role that methods play. In this paper, we study how the use of systematic and heuristic methods shapes the process experiences of students. A total of 213 students participating in a master-level course on design theory and methodology were instructed to use either systematic or heuristic methods while designing a product concept. We find significant differences in how the methods influence students' perceived time pressure, motivation and effort spent. Moreover, based on a cluster analysis, we find support for the idea that the students' mindsets influence their experiences and task assessment.

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Teaching students about methods and how to use them is an important objective in engineering and design education. Educators use methods to structure different facets of design education in the classroom and discussions about these issues. They also use methods to teach students specific work practices and processes for handling design activities and analyzing the objects of design. Method teaching also provides students with a frame of reference when learning how design is carried out in practice, with different methods fulfilling important parts in structuring the 'arranged practice' of design in education (Andreasen, 2011).

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the conceptual phase of design. Given the integral role methods fulfill in design, a number of definitions for what constitutes a method have been proposed in the literature (for an extensive overview see [Araujo, 2001](#)). For the purpose of this study, and following [Andreasen](#), we define a method as ‘a goal-oriented rationalization of designers’ work in the form of a standardized work description’ (personal communication, 11 April 2011).

We also adhere to the notion that students and designers develop a ‘method mindset’ as they learn to use different methods ([Andreasen, 2003](#)). A method mindset pertains to the knowledge, skills and beliefs students and designers acquire in the process of learning to use a method. It covers at least the relevant knowledge and experiences that are needed to use a method as well as the relevant experiences that influence whether a method will be preferred over alternatives. A method mindset represents the ‘mental equipment’ that a student must have in order to purposefully use a method to his or her benefit. A method mindset determines a student’s ability to grasp different facets of a method and its application ([Andreasen, 2003](#)); thus, in order to have a good ability to do so, the student must cultivate a proper method mindset. In engineering and design education, method teaching is introduced as a means of providing students with valuable learning experiences on their way to becoming designers. We recognize that teaching students to use different methods often includes the aim of building a proper method mindset (if not explicitly, at least implicitly).

Several authors have questioned the effectiveness of method teaching in design education ([Andreasen, 2011](#); [Dorst, 2008b](#); [Jensen & Andreasen, 2010](#)). Moreover, while educators devote much time to teaching students to use different methods, few methods become widely used in practice ([Araujo, Benedetto-Neto, Campello, Segre, & Wright, 1996](#); [Birkhofer, Kloberdanz, Sauer, & Berber, 2002](#); [Geis, Bierhals, Schuster, Badke-Schaub, & Birkhofer, 2008](#); [Jänsch & Birkhofer, 2007](#)). A well-known reason for this is that formalized methods – as abstracted rationalizations of design activities – seldom account for all the relevant ‘real-world’ peculiarities that can emerge when doing design in practice. For example, [Dorst \(2008b\)](#) pointed out three aspects of method usage that typically have been overlooked in the development of design methods, referring to variation in the *object* of a design activity (e.g. variation in the problem, the solution or the challenge), in the *context* of a design activity (e.g. variation in the organization in which it happens and the resources available), and perhaps most importantly, in the *actors* undertaking a design activity (e.g. variation in the designer and/or the design team). Still, few research studies have been conducted to support the link between method usage and quality of design outcomes ([Blessing & Chakrabarti, 2009](#); [Finger & Dixon, 1989](#)) with almost no efforts spent so far to understand why designers come to favor some methods over others ([Wallace, 2011](#)). In the same vein, few studies have addressed how designers experience different work practices

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