

Developing theory-driven design research



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Design research is increasingly weak in comparison with other fields; without action to increase scientific, theoretical, and methodological rigour there is a real possibility of the field being superseded and becoming obsolete through lack of impact. The aim of this paper is to show how design research could become more rigorous, relevant and have greater impact. I conduct a two-part review that combines systematic and critical components. Part one characterises the major scientific challenges facing design research, and part two examines how such challenges have been addressed in related fields. I identify key learning indicating future directions for theory-driven design research. I conclude by providing some concrete recommendations for the field of design research and individual design researchers.

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Design research ranges from descriptive examinations of design in context, to prescriptive propositions for how design should be (Blessing & Chakrabarti, 2009, p. 15), and from the individual to the organisational level (McMahon, 2012, p. 570). To address research questions along this spectrum design researchers have drawn on a series of findings and methods from related fields (Cash, Skec, & Storga, 2013, p. 45; McMahon, 2012, p. 565). These fields overlap with design research in relation to subject, methods, or theory, however, design researchers face a number of specific scientific challenges. Increased rigour is needed to avoid stagnation, low impact and potential obsolescence. Design research risks being superseded by other fields eager to include design science in their portfolios.

The need for action is clear. Design researchers are finding it increasingly difficult to claim that examinations of design phenomena constitute a unique contribution. For example, management researchers are exploiting opportunities to adopt design as another managed process. The *Journal of Product Innovation Management (JPIM)* (a highly ranked management journal) has begun to include design as part of its portfolio, with special issues including ‘*Product design research and practice*’ in 2011, and ‘*Co-creation with customers*’ in 2017. Similarly, the *Journal of Operations Management (JOM)* has created its own ‘*Design Science*’ track, and *Thinking & Reasoning* has explored many topics that underpin design research, for example, its 2015 special issue

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on ‘*Creativity and insight problem solving*’ (Sowden, Pringle, & Gabora, 2015). Thus, design research as a unique field is being challenged across the entire descriptive/prescriptive spectrum.

Despite the potential for design research to leverage these parallel developments by providing theory that other researchers could exploit, there is little evidence of that happening. In the 2011 *JPIM* special issue, the top four general design journals (see [Appendix](#)) received a total of 17 citations; in its 2017 special issue they received none. In *JOM*, the top design journals received only one citation between 2010 and 2016. Similarly, the 2015 *Thinking & Reasoning* special issue included only eight citations to the top design journals. Generally, the journals in these related fields have a higher Impact Factor (based on the journal listings by [Liang et al. \(2015\)](#) and [Gemser, De Bont, Hekkert, and Friedman \(2012\)](#)) despite representing fields of similar overall size to design research. Contrasting average Impact Factors for the top journals in 2016 is revealing (Average Impact Factor of top four journals in: operations management – 3.297, innovation management – 3.491, applied psychology – 7.973, design – 1.802). Also, researchers publishing in design journals often draw on theories developed in fields such as management or applied psychology. For example, [Yu, Honda, Sharqawy, & Yang \(2016\)](#) (*Design Studies*) adopt the theoretical foundation provided by [Ball, Evans, Dennis, & Ormerod \(1997\)](#) (*Thinking & Reasoning*), and [van der Bijl-Brouwer and Dorst \(2017, p. 36\)](#) (*Design Studies*) use [Verganti \(2008\)](#) (*JPIM*) as an explicit theoretical counterpoint. However, instances of researchers in these alternative fields using design research theory are rare.

While design researchers draw extensively on related fields, the reverse does not occur. This asymmetrical relationship emerges clearly in relation to the field of innovation management. In 2016, the top four innovation management journals were cited in over 16% of the papers in the top design journals, but the top design journals were cited in only 2% of innovation management papers. This disparity is particularly critical since the research questions, methods and associated theories in these examples are very close to those found in design research. In 2016, 13% of the papers in the top four innovation management journals dealt specifically with a ‘product design’ aspect and almost all were related to some aspect of product development. Common topics included ideation and innovation, idea selection and team interaction, and were studied using a variety of methods familiar to design researchers, such as latent semantic analysis, cases, interviews, experiments and surveys. Some authors, such as Ball and Ormerod ([Ball & Ormerod, 2000a](#); [Ball et al., 1997](#)) and Karjalainen and Snelders ([Karjalainen & Snelders, 2010](#); [Person, Schoormans, Snelders, & Karjalainen, 2008](#)) publish across design and other fields. However, despite overlaps in the research approach, topic and some authors, the other fields

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