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Practice research in design: Towards a novel definition

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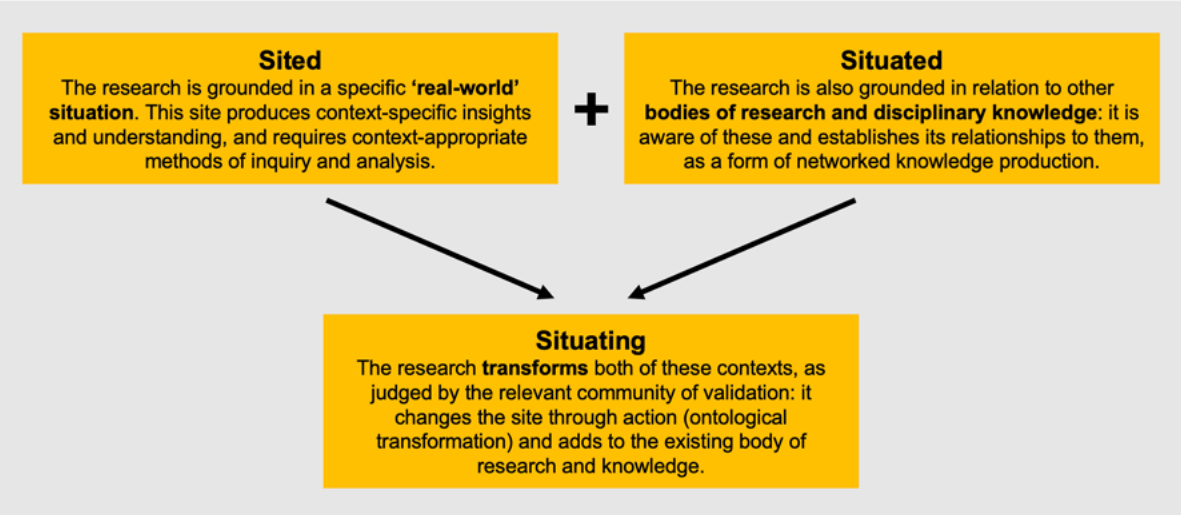
Executive summary

This paper offers a new characterisation of practice research in design through an interdisciplinary, exploratory endeavour to find a shared perspective and vocabulary. It starts by recognising the ongoing debates among academics, practitioners and funders in design, media and the arts about what practice research is and how it can be conceptualised, articulated and communicated (e.g. Vaughan, 2017; Bulley & Sahin, 2021; Vear, 2022). The need to make sense of practice research in design as *research*—and not just as *practice*—is a response to challenges both old (such as ancient philosophy's arguments separating scientific knowledge from practical knowledge and the 'knowledge of craft') and more recent ones (such as the assessment of research quality in art and design higher education institutions). As design and design research are increasingly called on to produce new solutions and contribute knowledge to address social and public policy issues, these discussions—complex and far from settled—become more pressing. The paper's key contribution is to propose a new characterisation of practice research in design, through two related frameworks and a definition.

The first framework is **a classificatory scheme** describing three conditions that must be met for something to qualify as practice research. This explains the grounds on which some design projects are classified as *practice research*, and not 'just' *practice* or *research*. The three conditions which, together, describe practice research, are that it is sited, situated and situating (see Figure 1).



↑ **Figure 1. The Triple S framework.**

This 'Triple S' scheme is derived from a review of literature and practice across a number of disciplines and informed by the authors' understanding of Pragmatism (Dewey, 1938), the institutional theories of art (Danto, 1964) and Institutionalism more broadly (Powell & DiMaggio, 1983).

The second framework is **an analytical framework** that specifies what is *produced through* practice research in design, emphasising again that its outcomes are different from those of research and those of practice. This framework rests on the distinction made in 'C-K theory' (Hatchuel & Weil, 2009; Le Masson et al., 2010),

which proposes that design creates both new 'concepts' or designs (C) and new knowledge (K): a new concept/design is proposed, on the basis of which new knowledge might be established. We argue that practice research in design produces concepts and knowledge that make a contribution to any or all of three different contexts:

- To the **issue domain** within which the practice research is sited and situated
- To the **current design practice**—the doings and sayings—of a community of validation involved in designing in or beyond that domain
- To **design research** itself, understood as having a distinct body of disciplinary knowledge and community of validation; and, potentially, to research in other disciplines.

Each of these different contexts comes with its own communities to whom the outcomes are relevant.

Finally, building on these two frameworks, we propose a new operational definition of practice research in design:

> Practice research in design is a form of networked, constructive knowledge production and practice development. It is carried out through inquiring into situations, informed by domain- and discipline-relevant knowledge and in relation to an appropriate and relevant community of validation. It results in the production of new concepts/designs and new knowledge, relevant to and for assessment by the community in the situation, as well as in new concepts/designs and new knowledge for design practice and for design research, relevant to and for assessment by design practice and research communities.

This characterisation of practice research in design departs from other approaches in that it does not presuppose principles, does not ground the definition in practitioners' lived experience, and does not fall back on the primacy of objects, or on the idea of tacit knowledge being the essential differentiator. Instead, what it offers is a way of articulating practice research in design through frameworks that are compatible with how research is currently being discussed in knowledge production networks, that is, in terms that funders understand, without having to insist there is something 'ineffable' or ultimately inexpressible about practice research. This new approach will help build common ground to analyse, understand and communicate practice research, and so begin responding to an ongoing challenge for practice research—how to render it open to aggregation and accountability.

1. Introduction

1.1 About this paper

This paper aims to offer a new characterisation of practice research in design through an interdisciplinary, exploratory endeavour to find a shared perspective and vocabulary to talk about practice research in design. The context is one of ongoing debates among academics, practitioners and funders in design, media and the arts about what practice research is and how it can be characterised, articulated and communicated (e.g. Vaughan, 2017; Stone et al., 2019; Piotrowska, 2020; Bulley & Sahin, 2021; Vear, 2022). This study focuses on practice research in design specifically, understood here as practices and knowledge associated with product, service, interaction, textile, material and communication design in higher education settings.

The study has been carried out by three researchers located in a higher education institution that conducts teaching, knowledge exchange and research in design and the creative arts, and that is also committed to critical and contextual discussion of these. Our motivation has been to make a constructive contribution to the complex and contested debates concerning how practice research in design—as it is carried out in higher education institutional settings—can be articulated, shared with and assessed by its relevant communities.[1]

To achieve this, we seek to clarify basic concepts and then propose some key distinctions to classify and illuminate practice research in design. This is based on reviewing a sample of literatures and sources identified across several different fields, which serve to orient the inquiry and, ultimately, provide a foundation for the suggested frameworks. Various iterations of the constructs informing these frameworks were discussed at three workshops at UAL in late 2021 and early 2022, and an international symposium organised by the Social Design Institute at UAL held in London in May 2022. Examining these constructs through the prism of the practice research projects that colleagues and PhD students offered as examples was helpful as a way of checking for relevance. As a working paper, this study does not claim to offer a comprehensive, systematic review of everything published on the topic across all relevant disciplines. Rather, it is a result of scanning and integrating significant contributions to discern key trends and terms to prompt further discussion. We hope that colleagues including PhD researchers and partners engaged in practice research in design will test and debate our proposed characterisation, which we anticipate iterating further.

1.2 Standpoints and theoretical frames

In order to understand what practice research is, what it is not and how it is different from practice, it is necessary to go beyond characterising individual instances of practice research, an effort taking place in several contexts (e.g. Bulley & Sahin, 2021; Vear, 2021). Reflecting on the acceptance of ready-mades as art, Arthur Danto pointed out that:

> to see something as art requires something the eye cannot descry—an atmosphere of artistic theory, a knowledge of the history of art: an artworld. (Danto, 1964, p. 580)

This has become known as the institutional theory of art (Danto, 1964; Dickie, 1974). The status of artworks as art is not determined by their formal properties, but by the practices and institutions shaping the production and consumption of art objects. Adopting this approach to discuss practice research in design, what is needed is a supra-level of analysis looking at the settings embedding these practices (Powell & DiMaggio, 1983) and the understanding of the institutional rules and norms prevailing in the relevant environments (Scott, 1995; Thornton et al., 2012). One must look at the institutional configuration in which practice research figures, at the:

> supraorganizational patterns of human activity by which individuals and organizations produce and reproduce their material subsistence and organize time and space […] symbolic systems, ways of ordering reality, and thereby rendering experience of time and space meaningful. (Friedland & Alford, 1991, p. 243)

Consequently, the characterisation of practice research proposed here is not wedded to specific outputs or methodologies. Complementing this institutional analysis to discuss practice research in design, we also draw on Pragmatist philosophy (e.g. Dewey, 1938) and its embrace of practical understandings of concrete, real-world issues, which foregrounds the primacy of experience and action, commonly cited in discussions of practice research (e.g. discussions of Donald Schon's work in Bulley & Sahin, 2021) and in design (e.g. Buchanan, 1992; Dixon, 2020). These theoretical frames are used to interpret the existing discourses articulating and communicating practice research, outside of design and in design. With respect to the former, the paper selectively reviews discussions of practice research in management, education, healthcare and creative arts practices. With regard to the latter, it engages with the field of design research through its early academic articulation (e.g. Alexander, 1964; Simon, 1966; Archer, 1979; Frayling, 1993; Schon, 1995; Cross, 1999) as well as the more recent attempts to understand the nature of practice research in design (e.g. Buchanan, 2001; Niedderer, 2009; Koskinen et al., 2011; Redström, 2017; Markussen, 2017; Vaughan, 2017). With respect to the analytical apparatus proposed to understand the outcomes of practice research in design, it builds on the work on C-K theory (Hatchuel & Weil, 2007; Hatchuel et al., 2009; Le Masson et al., 2010). In other words, what is produced through practice research in design is always more than just *research* and necessarily includes changes to the situations in which design practice research is conducted.

1.3 Structure of the paper

The paper begins with a discussion of the contexts from which practice research in design has emerged, discussing the funding landscape and other aspects of the research apparatus, with a particular emphasis on the UK. We then review literatures that have dealt with practice research. We summarise recent accounts

that offer a general definition, identifying key terms, and then literatures in specific disciplines where practice research has been advanced—management, education, healthcare, the creative arts and design. We then integrate constructs we see as particularly helpful in accounting for the specificities of practice research in design. We draw these investigations together in advancing two frameworks and a definition of practice research in design, offering a worked example to bring these proposals to life. We conclude by summarising the contributions of this paper.

2. Context

Why are we concerned with practice research? A number of intersecting developments have contributed to the rise of, and interest in, the possibilities and implications of practice research in design in recent years.

2.1 The landscape of research funding

The emergence and stabilisation of practice research is tied up with institutional changes in higher education, such as the assessment of research quality and the development of practice-based doctorates (Bulley & Sahin 2021). Research funding policy over the last two decades has linked the selective distribution of public funds across academic institutions to 'impact' (Furlong & Oancea, 2007; Khazragui & Hudson, 2015; Bulley & Sahin, 2021). The Research Assessment Exercise (RAE) and, later, the Research Excellence Framework (REF) in the UK opened up the possibility of positioning practice and applied research as having legitimacy and something to be publicly funded. This contributed to "a shift in public understanding of research":

> from a descriptive ('what researchers/academics do') to a prescriptive account ('what researchers should deliver in account of the public money received'), with all the consequences that derived from this. (Furlong & Oancea, 2007, p. vii)

Recent attempts to define practice research, including from within the arts, design and performance sectors (e.g. Bulley & Sahin, 2021; Biggs & Karlsson, 2010; Vear, 2022), should be understood in this context. For example, in a substantial review commissioned by the Practice Research Advisory Group-UK (PRAG-UK), Bulley & Sahin (2021) said the value of such research is in its ability to reach beyond traditional audiences: "Practice research allows intuitive, embodied, tacit, imaginative, affective and sensory ways of knowing to be shared in ways that other more traditional research forms often do not" (p. 1). Debatably, such arguments are motivated by the need to articulate practice research in terms that will resonate with funders, as much as a desire to understand what practice research *qua* research is.

2.2 Research as a way of intervening in social and public policy issues

A second development is the growing reflexivity of academics regarding the historical and institutionally located nature of their work and the effect it has on

practices. The institutionalisation of practice research is linked to the demand for a 'new' mode of knowledge production that is transdisciplinary, more sensitive to the context of its production and 'relevant' from the point of view of its users (Gibbons et al., 1994; Nowotny et al., 2001). The approach encourages the blurring of the lines between researchers and practitioners (Van de Ven, 2007). This development sits within wider debates about methodologies, co-creation, accountability and relevance of research (Bell & Pahl, 2017).

Intersecting with these debates have been developments in understanding the effects of research on worlds of practice, across sociology, anthropology, geography and the humanities. Here, established forms of research have been challenged by a range of perspectives, including the decentring of the human subject (Pickering, 1993), a move away from the logic of justification to the logic of discovery or "invention" (Barry et al., 2008; Lury & Wakeford, 2012; Marres et al., 2018) and the need to move beyond research as representation to research as acting within systems with material consequences (Floridi, 2017), and thinking through making (Ingold, 2013). Such contributions have heightened the awareness that research itself is a form of practice underpinned by different interests and agendas (Haraway, 1991; Law, 2004).

2.3 The discontents of Modernity

The turn towards practice research can also be seen to be related to the popularity of Pragmatic outlooks, and increasing scepticism about legacies of Modernism, the traditional intellectual hierarchy in Western knowledge production that puts contemplation above practice, and representation over intervention (Habermas, 2015; Bernstein, 2004). When Dewey insisted that there was no distinction between "common sense" and "scientific" inquiry (Dewey 1938, pp. 66–85), he was paving a way for practitioners to enter the realm of science and was challenging the reified idea of expertise underpinning scientific progress in the West. These considerations pre-date American Pragmatism, though—Aristotle (*Nichomachean Ethics*, 1141b16–17—see Crisp, 2014) made a point that, "practice is concerned with particulars" (1141b16–17) and "is concerned with action" (1141b18). This prompted him to ponder the possibility of the science of particulars and to distinguish between different cognitive modes: scientific knowledge, practical knowledge and 'techne' or the knowledge of craft.

One could speculate that truly understanding practice research has been hampered by a centuries-old disparaging of practice, and the praise of detached contemplation, reinforced by the development of research expertise as removed from everyday life (Habermas, 2015; see also Bulley & Sahin, 2021). The difficulties encountered by practice-oriented researchers justifying their work as 'research' are due to a form of "epistemic injustice" (Fricker, 2007) inflicted on practice research: a systematic exclusion, silencing and misrepresentation as a topic of inquiry resulting in a lack of satisfactory concepts of analysis.

2.4 Visibility of design in relation to societal innovation

Finally, there is the increased attention paid to design in recent years, as a methodology for engaging stakeholders in research, delivering innovation and translating research into impact. In technological, social and public innovation, for

example, design and design research are seen as a practical methodology enabling innovation to address society's problems (Armstrong et al., 2014; OECD, 2018; Kimbell et al., 2021). In the UK, for example, the launch of a Future Observatory in 2021, through a new partnership between the Arts and Humanities Research Council and Design Museum, highlights the need to combine knowledge production, applied creativity and audience engagement to address the societal challenges in the UK.[2] In this formulation, design practice needs a closer engagement with research and can aid its translation, while also being central to delivering innovation, thus providing an evolving context for practice research that is at once transdisciplinary, applied and situational.

3. Key terms

3.1 Research

A dictionary definition of research defines it as "the systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions".[3] While systematicity of analysis remains a condition repeated across different contexts and forms of research, what it means to "establish facts and reach new conclusions" varies. Researchers working in different domains have different approaches to interpretation, and argumentation and inquiry methods, and the communities of research to whom they are accountable—the peer reviewers, as well as funders and users of research—have different expectations too.

Further, researchers working in different domains have different purposes and aspirations. Thus, scientific research is a *systematic* way of gathering and analysing data, which builds theories for the description, explanation and—often—prediction of the nature and the properties of the world. Research in the social sciences takes a wide variety of forms. These rely on often incommensurable perspectives on the status of social structures and the limits of knowledge claims (Blaikie & Priest, 2017). Research in the humanities can be more exploratory than explanatory: knowledge claims may not be straightforwardly falsifiable but, rather, are a matter of interpretative or hermeneutic argumentation.

The roots of these differences can be traced to the philosophy of science and the different conceptions of knowledge, as well as the status of the objects or social worlds under investigation. For instance, according to some more pragmatically minded schools:

> science is seen as an outgrowth of ordinary inquiry, and thus it starts and ends in experiencing, is always constrained by fallibilism, proceeds utilizing abduction, and instead of 'knowledge', it produces warranted assertions. (Martela, 2015, p. 537)

In contrast, standard positivistic approaches would hold that the goal of scientific pursuit is the analysis of propositions with a view to establishing objective truths and universal theories (Baker & Hacker, 1984). Thus, there are significant differences in how research is characterised in different disciplines.

One could question, then, whether the common evaluative criteria used for the allocation of UK funding (of quality, originality, significance and rigour) can be assumed to apply across different contexts (Cronen, 2001; Shotter, 1990). Distinctions between different types of research, such as the classification proposed by Stokes distinguishing between "pure basic research" (Bohr), "pure applied research" (Edison) and "user-inspired basic research" (Pasteur), highlight further the difficulty of finding a common evaluative criteria for assessing all types of research (Stokes, 2011). Design practice research can be said to present a specific set of challenges: the 'unease' of fit of such criteria is apparent in discussions in design concerning the importance of "the science of the particular" (Buchanan, 1992), "creative propositions" (Zimmerman et al., 2010), "generative statements" (Gaver, 2012) and "expansion processes" (Hatchuel, 2001).

All these difficulties noted, it is worth observing that the most recent definition of research suggested for the purposes of REF 2021 in the UK, as "a process of investigation leading to new insights, effectively shared", offers a relatively open and generalisable formulation.

3.2 Practice

Practices have been defined as "open-ended spatial-temporal manifolds of actions" (Schatzki et al., 2005, p. 471) and as "sets of hierarchically organized doings/sayings, tasks and projects" (cf. Reckwitz, 2002; Warde, 2005). They have been characterised in terms of practical knowledge or "the knowing how" as well as constructs relating general understandings, explicit rules and principles, and implicit purposes (Schatzki, 2005; Nicolini, 2012). As per Shove's and Pantzar's (2005) approac—in the words of Goldkuhl—practices are "meaningful assemblages of human actors (including their intra-subjective and inter-subjective inner worlds), actions, linguistic objects (as utterances and documents) and material objects. Practices are considered meaningful because what is done makes sense to those involved" (Goldkuhl, 2011, p. 10).

A praxeological approach has been used in a number of academic fields, including knowledge management and organisation (e.g. Corradi et al., 2010; Gherardi, 2000), information system adoption and use (Orlikowski, 2000), consumption (Shove et al., 2012; Warde, 2005), media (Postill, 2009) and education (Trowler et al., 2012). Practice theory has also been applied to studies of design (Shove, 2006; Julier, 2007; Kimbell, 2011).

Practices—including the practices of design and social design—can be researched and investigated using such constructs. In fact, the building blocks of the praxeological approach—such as Shove's (2005) triad of meaning, competencies and materials—underpin one of the key constructs of this paper: networked knowledge production. This combines ideas from practice theory with ideas from institutionalism and neo-institutionalism (Powell & DiMaggio, 1983; Scott, 1995; Thornton et al., 2012). Because praxeology does not speak directly to the question of why some practice—but not all—can be classified as research, nor how systematic knowledge production is enabled through practice, in order to understand practice research as research, we need to take a broader view incorporating these institutional forms of analysis.

4. General definitions of practice research

There have been many attempts to define and describe practice research, often in relation to specific disciplines (see sections 5 and 6 below). For example, Linda Candy (2007) introduced the distinction between "practice-based" and "practice-led" research, terms that have been used interchangeably in some contexts (e.g. Rust et al., 2007) and are commonly cited in studies of design. However, this usage is different to that in other disciplines such as psychotherapy or public health (Bulley & Sahin, 2021). A long list of related terms is summarised by Bulley & Sahin (2021), including practice as research, embodied research, participatory action research and arts research. Along with Bulley & Sahin (2021), this paper adopts the PRAG-UK group's strategy of using the umbrella term "practice research" to cover all variants.

Space does not allow a detailed account of the major contributions, but we discuss here the central considerations from each source. Bulley & Sahin's review (2021) identifies three "descriptive terms" for practice research:

> 'practice' (which may be represented by a proxy 'documentation'), 'research narrative' (which need not necessarily be a separate component from practice if the research is evident from the practice itself) and 'practice research output' (in which practice is conveyed or embodied in a research narrative, where practice is the significant method of research). (Bulley & Sahin, 2021, p. 29)

Central to their discussion is the idea of audience(s) for research—tying back to the UK REF definition of research as something that is "effectively shared" and therefore public and deserving of public investment. They argue that "research creates discourse—without effective sharing, there is a reduced chance of discourse, and the validity of the research can come under question" (Bulley & Sahin, 2021, p. 33). Some such audiences—which we refer to as "communities of validation"—therefore play an important role in 'validating' practice research as research.

Another contribution that offers a general definition, independent of discipline, is *The Routledge International Handbook of Practice-Based Research* edited by music scholar and practitioner Craig Vear (2022), which brings together the significant amount of work underway to develop approaches and frameworks to understanding practice research cutting across different disciplines. Writing in the introduction, Linda Candy, Ernest Edmonds and Craig Vear define practice research as:

> a principled approach to research by means of practice in which the research and the practice operate as interdependent and complementary processes leading to new and original forms of knowledge. By 'practice', we mean taking purposeful actions within a specific context, typically in a creative or professional way: the making, modifying or designing of objects, events or processes. (Candy et al., 2022, p. 27)

They go on to claim that practice research can be assessed on the grounds of whether it is: original, validated, contextualised, shareable and retainable (pp. 193–199). They also articulate four principles (p. 28):

1. Practice and research are complementary but distinctive
2. The research is based within a world-of-concern defined by practice
3. The practitioner researcher is at the centre of the research
4. The research aim is to generate new knowledge.

The connection between research and practice (principle 1) and the claim to the generation of knowledge (principle 4) are difficult to question, even though they are perhaps too general to be truly informative. Principle (2) could be contested and, in fact, some of the design scholarship referenced below does stress the primacy of research concerns and problematises the positionality of the researcher in the process.

Another proposed approach to understanding practice research in general is an analytical framework proposed by Vear. He distinguishes between two perspectives on knowledge: "in-vitro", or outside → in knowledge/perspectives, and "in-vivo", or inside → out, suggesting that "new knowledge from practice-based research" derives from the in-vivo perspective (2022, p. 224). He proposes a five-'layers' framework to allow researchers to surface and reflect on how they are constructing their practice research, distinguishing between mode, knowledge type, perspective, preference and verification (Vear, 2022, pp. 221–240), and demonstrates the application of this classification to interrogate practice research projects.

Vear's proposal takes an emic stance: an approach to the study of a particular phenomenon in terms of its internal elements and their functioning, rather than in terms of any existing external scheme. It offers useful guidance for practice researchers and will surely improve the understanding and self-understanding of practice research. However, the emphasis on developing the neglected in-vivo perspective relies on a distinction between different modes of knowledge: explicit/propositional as opposed to implicit/tacit (see also Niedderer, 2022). Tacit knowing is characterised as fundamental to practice research but also recognised as "by definition inexpressible, or hidden inside your experiences and practice" (p. 194). Therefore, it would seem that practice research cannot by definition be explained on its own 'true' terms in the in-vitro environment. This inherent inexpressibility is reinforced elsewhere in the volume (Vear, 2022) by a call for "a parallel means of communication that illuminates the knowledge [specific to practice research]—in effect, a linguistic one" (p. 29).

So, while the contributions in the Routledge edited collection make important advances to the general understanding of practice research, they have limitations. The in-vivo perspective proposed by Vear presupposes the terms of analysis and expression as different from those used in the wider research ecology that frames the discussions of practice research from the perspective of funders of, collaborators in, or users of research. We can learn more from turning to specific instances in different disciplines (section 5) including design (section 6) to identify the specificities relevant to practice research in design.

5. Disciplinary perspectives on practice research

Practice research is a topic of discussion across several disciplines and domains (Bulley & Sahin, 2021; Michaels, 2022; Candy et al., 2022). It underpins the experimental method of the natural sciences, such as biology, chemistry and physics (see, for instance, Latour & Woolgar, 1979/2013). It is fundamental to disciplines such as development studies, policy research and information science (Sumner, 2006; Austin & Carnochan, 2020). As a term, "practice research" began to appear in academic publications in the 1990s and its use has grown steadily since then: "the greatest and earliest use of the term was in various fields of medicine and healthcare professions, with increasing use in education, creative arts and humanities in more recent years" (Michaels 2022, p. 42). It is beyond the scope of this paper to review every discourse where practice research has become established. Rather, the paper looks at developments in the fields of education, health and medicine, management and creative arts practice—before, in section 6, turning to design explicitly—to establish key themes and concerns.

5.1 Education

One of the main contributions here is the definitional work done by Furlong & Oancea (2007) and their related framework for assessing quality. Their definition of practice research in education is broad and inclusive, as "multiple models of research explicitly conducted in, with and/or for practice" (p. 115). Hammersley (2008) takes issue with the definition, arguing that it is not nearly precise enough to pinpoint academic practice research and establish relevant assessment criteria. He identifies the difference between inquiry that happens incidentally through the course of practice, practical research where "the aim is to produce knowledge—descriptive, explanatory or theoretical—that is judged as important for decisions about how the practice should be performed", and academic research, "which, as the name implies, is concerned with contributing to a body of disciplinary knowledge" and whose concerns may be broader than practitioner interests.

Debates in this field also highlight the different drivers of interest in practice research. On the one hand, there are 'bottom-up' arguments for practice research (Erickson 2014) as an approach better suited to the nature of the problems of education and pedagogic practice under investigation—which are always situated and particular (Dewey, 1938; 1939)—than models borrowed from 'hard' science (e.g. Randomised Controlled Trials). From this perspective, the objective of research is not the discovery of generalisable theory or law, but:

> […] an inquiry into 'what is working' locally, with detailed attention devoted to inquiry into the 'what and how' of local practices, in order to determine specific local mechanisms of cause—why what is working does so, why it sometimes works better, why it sometimes falters… (and this is a continuing inquiry because history does not repeat itself exactly, from year to year, even in the same setting). (Erickson, 2014, p. 5)

On the other hand, there is the conviction that practice research in education must answer to standards that go beyond the localised and contextually idiosyncratic specificities of situations. And yet, as Kemmis argues, practice research cannot be sufficiently accounted for in the terms imported from standard research, in that it seeks to change three things: "practitioners' practices, their understandings of their practices, and the conditions in which they practice" (Kemmis, 2009) and, in order to do this, it draws on the exposure to different sets of practices, or what Kemmis & Smith (2008) call "practice architectures", which constitute mediating preconditions for practice. While this does not refute Hammersley, it does emphasise the centrality of situated practice to practice research. Furthermore, this highlights the need for a different model of accountability: with practice research advancing the agendas of a multiplicity of stakeholders, it has to be answerable to diverse standards. Even more radically, because of the diversity of the contexts and stakeholders of practice research, rather than presupposing that there is a finite and fixed set of criteria against which practice research can be assessed, it might be advisable to see the assessment of practice research as a form of practice in its own right and something performed by a community of validation.

5.2 Management

Henry Mintzberg's work in the 1970s and the case study work of Andrew Pettigrew show the long heritage of practice research in management. Textbooks such as *Producing Management Knowledge: Research as Practice* (Löwstedt & Stjernberg, 2006) stress the need for issue-driven and embedded approaches premised on inductive knowledge production. Discussions at the forefront of the strategy-as-practice approach (e.g. Jarzabkowski et al., 2007; Cailluet & Whittington, 2007) solidify the need to be looking at action in order to understand the nature of knowledge claims made in management. However, management scholars insist on the distinctions between academic research and practice. Bartunek and colleagues argue that the gaps between academics and practitioners are perpetuated by the external factors shaping academic work, such as ranking systems and special issues of journals (Bartunek & Rynes, 2014). A different way of articulating this distinction comes from the proponents of the strategy-as-practice approach. Seidl & Whittington alert us to the problem that:

> Fascination with the detailed understanding of local praxis can produce what we term 'micro-isolationism', whereby a local empirical instance is interpreted wholly in terms of what is evidently present, cut off from the larger phenomena that make it possible. Common enough throughout organization studies (Bamberger, 2008; Whittington, 2012), this micro-isolationism treats organizations as the isolated containers of focal phenomena. (Seidl & Whittington, 2014, p. 1408)

This is a risk that applies across all the fields concerned with practice research and presents an important challenge. The situational and context-dependent insights characteristic of practice research do not always translate well into generalisable claims that apply across different contexts. The discourse of management highlights thus a recurring challenge for practice research in that the situation-

specific insights are not obviously 'aggregate-able', and therefore not seen as contributing to a growing body of evidence, as traditionally understood. This also underscores the need for new analytical approaches capable of cross-cutting the situations of inquiry, such as, for instance, Adele Clarke's situation analysis presenting the means of mapping out and of studying empirically the elements and relations of situations on three levels: individual actors and actants, collective agency and institutional logics and the overarching relational forces shaping the situational ecologies (Clarke, 2005). Approaches like this see practice research as distinctively networked and, thus, only explicable in ecological and systemic terms, supporting the point that practice research is partly defined by its particular institutional entanglements.

5.3 Medicine and healthcare

The term "practice research" was first popularised in medicine and healthcare research as a reaction to a turn taken in clinical studies (Michaels, 2022). The systematic use of research evidence to inform practice was being widely promoted, and randomised controlled trials, specifically, were rapidly becoming a popular and accepted method of generating evidence. Practice-based research was seen as a reaction to the hierarchy of evidence that placed emphasis on rigorously controlled experimental studies carried out in large academic institutions. There was a view among some practicing clinicians that research was becoming the province of "ivory tower academics", divorced from real-world practice, leading to the formation of new networks to carry out research in practice settings (see, for instance, Michaels, 2022).

Sources discussing practice research in medicine and healthcare stress the importance of multi-stakeholder associations, such as primary care practice-based research networks (PBRNs), which challenge "traditional distinctions between research and quality improvement (QI), emphasising the importance of linking discovery and application, research and practice" (Mold & Paterson, 2005, p. 512). These kinds of community of inquiry and practice are said to work well if the agenda is set collectively and not just by one group of stakeholders.

Relatedly, *The Routledge Handbook of Social Work Practice Research* (Joubert & Webber, 2020) argues that social work is effectively a negotiated process of inquiry, where practitioners, researchers, service users and educators come together, and where possibilities are shaped by institutional logics and cultural norms. Here, as in the other fields discussed, "there are challenges in moving beyond 'practice-based' research, towards building a progressive body of knowledge that can provide a basis for future 'evidence-based' practice in healthcare and public health" (Clift, 2012, p. 120). Once again, we encounter the challenge of generalising and aggregating in practice research, as well as the need to think about it in the context of institutional ecologies and as a form of networked knowledge production.

5.4 Creative arts practice

Writing in 2007 about practice research in art, design and architecture, Rust et al. identified a lack of clear or adequate definitions for their field and proposed to define practice research as "research in which the professional and/or creative practices of art, design or architecture play an instrumental part in an inquiry" (ibid, p. 11). Of

particular consideration in this field of creative arts and design is the status of the artefact. Bulley & Sahin suggest that "practice research is a type of research where practice is the significant method conveyed in a research output" (Bulley & Sahin, 2021, p. 4). Smith & Dean observe that the product of practice research is integral to the research process and contributes to the answering of the given research questions (2009, p. 5). They also recognise that:

> the training and specialised knowledge that creative practitioners have and the processes they engage in when they are making art can lead to specialised research insights, which can then be generalised and written up as research. (2009, p. 5)

There is therefore a certain ambiguity in how the term "practice research" is used: either with the emphasis on the product or tangible output as of primary interest or, on the other hand, stressing the significance of the process as a method of inquiry. Candy (2006) defines this as the difference between practice-based and practice-led research:

> 1. If a creative artefact is the basis of the contribution to knowledge, the research is practice-based. 2. If the research leads primarily to new understandings about practice, it is practice-led. Practice-based Research is an original investigation undertaken in order to gain new knowledge partly by means of practice and the outcomes of that practice. In a doctoral thesis, claims of originality and contribution to knowledge may be demonstrated through creative outcomes in the form of designs, music, digital media, performances and exhibitions. Whilst the significance and context of the claims are described in words, a full understanding can only be obtained with direct reference to the outcomes. Practice-led Research is concerned with the nature of practice and leads to new knowledge that has operational significance for that practice. In a doctoral thesis, the results of practice-led research may be fully described in text form without the inclusion of a creative work. The primary focus of the research is to advance knowledge about practice, or to advance knowledge within practice. Such research includes practice as an integral part of its method and often falls within the general area of action research. (Candy, 2006, p. 1)[4]

The very distinction between the artefact (seen as a locus of practice) and the text (seen as a locus of traditional Western knowledge) is indicative of the fact that, historically, many efforts to define practice research have been articulated with one eye on advocacy in the funding landscape. In these attempts, the terms in which the discussion takes place are imposed from outside the creative disciplines, and

the priorities are set by the external demands of existing evaluation regimes, rather than arising from the creative practices themselves.

A second specific characterisation of practice research in the creative arts turns on the relation between the research and its intended audience—which might be creative practitioners. It is in the debates related to the status of the artefact (or performance), and the audiences to whom the practice research is addressed, that the distinctions between knowledge and other forms of outcome are heightened. These discussions underscore the difficulties of 'dislodging' practice research from the conditions and contexts of its production and highlight the need for what we call situational understanding.

5.5 Emergent cross-disciplinary themes

Variants of practice research exist in several academic disciplines, shaped by their institutional locations and agendas, and in relation to different audiences, including practitioners who may have expert knowledge outside of the academy. What is clear is that practice research is a form of networked knowledge production and practice development where different institutional agendas coalesce. The importance of understanding the ecology of institutional logics in relation to what is and is not practice research is further reinforced by the realisation that the manifestations of practice research across disciplines are different enough to make it difficult to speak of sufficient, necessary or essential properties uniting all practice research.

Rather, there are some emergent themes. In addition to the need for thinking underpinned by the awareness of networked knowledge production, several accounts of such practice research emphasise the importance of the situation and the experiential knowing involved, to explain how the doing and knowing of the practitioner and the doing and knowing of the researcher come together in a single person or project in relation to an audience. This amounts to saying that a shared general characteristic of practice research is that it is situated and thus that it calls for situational understanding. Taken together, the understanding of practice research as a form of networked knowledge production, and the need for situational inquiry, bring focus to yet another emergent theme, namely that the criteria for the assessment of practice research cannot be fixed. Here, again, the review of literatures across the different domains suggests that the notions of "communities of inquiry" (Dewey, 1938) and "communities of practice" (Lave & Wenger, 1991) are helpful. However, these need to be understood in terms analogous to the peer review process.

Thus, to conclude, we identify three emergent themes that apply across the discourses reviewed: the need for **situational understanding** and analysis; the requirement to see the attempts to define practice research in the context of institutional ecologies as a form of **networked knowledge production**; and the ensuing necessity not to fix the assessment criteria for practice research but, rather, to see the assessment as a form of practice in its own right and something performed by a **community of validation** including researchers, practitioners and publics. Turning now to accounts of practice research in design, we begin to see how these themes are reflected in the specific discourse of practice research in design.

6. Practice research within studies of design

To map the contributions from design studies regarding the nature of practice research, we first examine briefly the institutional location of design as an academic field (with a focus on the UK), we review debates therein, and summarise some of the significant articulations that have been proposed. Unanswered questions about practice research in design concern the locus of research. Is it to be found in the outputs produced? Does it include artefacts as well as texts? Is it inherent in the process of designing, whatever methodology is applied? Is it found in the persons or situations involved in, and transformed through, researching?

6.1 Design as an academic discipline

The field of design research has been in formation since the practice of design became gradually institutionalised in art schools, polytechnics and universities, as well as corporate settings (Buchanan, 2001; Niedderer & Reilly, 2010; Koskinen et al., 2011; Redström, 2017), and, consequently, became an object of academic investigation and site for doctoral study (Candy et al., 2022; Phillips, 2022). In the UK, this intensified in the 1960s with a series of events: a conference on design methods in London in 1962 (Jones & Thornley, 1963), the establishment of the Design Research Society (DRS) in 1966, and the foundation of journals and scholarly meetings, as well as other interactions among designers, architects, engineers and others working internationally (Margolin & Buchanan, 1995; Bayazit, 2004). Significant changes in higher education in the UK in the 1960s and 1990s resulted in a growing academicisation of arts and creative design practices—and a problematisation of design as research. In this context, the theoretical foundations of, and methods for, design (e.g. Alexander, 1964; Archer, 1979; Simon, 1988; 1996), the status of design (Cross, 2001) and design pedagogy (e.g. Jonas, 2015; Tonkinwise, 2017) have been much debated. For example, Bruce Archer's "Design as a discipline" (1979) and Nigel Cross' "Designerly ways of knowing" (1999) asked what criteria design must satisfy to be considered an academic discipline. Some decades later, specialists in design research continue to assert a lack of unity in theories of design, identifying shifts in paradigms that have disrupted field-building, and noting the fragmentation of design professions (Le Masson et al., 2013).

In this discourse, there is a pronounced contrast between paradigms of knowledge that can be labelled positivist (where knowledge is acquired as a given) and constructivist (where knowledge is constructed through experience). Among some researchers, there is an ambition to universalise the design process, motivated by the prospect of turning design into a "hard" academic discipline (Cross, 1984), evident for example in Simon (1996) or Hatchuel & Weil (2007) and Le Masson et al. (2013). On the other hand, Donald Schon (1995) and others working in the Pragmatic tradition challenged the idea that there can be a unified "science of the artificial" and, by extension, of design.

These disagreements persist in new manifestations. The early disputes over the relationship between design and science reverberate in more recent considerations of the role of artefacts as vehicles for theory construction (see Beck et al., 2013;

Bowers, 2012) and the role of theory in design (e.g. Friedman, 2003; Markussen, 2017; Redstrom, 2017; Zimmerman & Forlizzi, 2008). Zimmerman et al. argue that there is a need "for serious development of research through design into a proper research methodology that can produce relevant and rigorous theory" (2010, p. 314). In contrast, Gaver (2012) and Biggs & Buchler (2007) point out that, because design does not operate in a domain-independent way, it is far from clear what "rigour" means when applied to "insights" generated in the context of design and design research. In this context, however, it could be argued—as Markussen does—that Gaver deflates the role that theoretical knowledge plays to "a matter of annotating portfolios or inspiring new successful designs" (Markussen, 2017, p. 88).

Such long-standing debates intersect with emerging vectors re-shaping the institutional landscape for design research, including demands for and claims to democratic participation in designing, and the need for innovation in response to social problems (Sanders & Stappers, 2008; Binder et al., 2011; Simonsen & Robertson, 2013; Julier & Kimbell, 2018). Further, recent research contributions that emphasise the ontological aspects of design and design research have foregrounded the need to pay attention to politics and situated positions, thereby giving rise to yet another articulation of practice in design (e.g. Fry, 2009; Escobar, 2018; Kesharvaz, 2018). Such varied institutional locations for understanding the relations between design, practice and research make it challenging to summarise key debates, because the agendas, logics and vocabularies developed within them are fragmented. It is not surprising, therefore, that articulations of practice research in studies of design are also varied, partial and contested. The crux of the matter is that, as Dorst (2016) pointed out, knowledge of design, and knowledge created through designing, resides in both practice *and* in academic research, and there is little common ground and communication between the two. This includes the lack of a *systematic* research foundation for much of the knowledge generated through designing, including in the creative design disciplines associated with historic arts schools. Over recent years, various scholars in design have attempted to resolve this, work which we now review and build upon in our attempt to articulate practice research in design.

6.2 Theorisations of practice research in studies of design

An early contribution to the debate comes from the moment when practice-based doctoral studies in creative design and the arts were being introduced in the UK and elsewhere. Christopher Frayling (1993) identified three kinds of relation between design and research—that research could be *for* practice (and so supporting the aims of practice), *into* practice (and so elucidating the character of practice) or *through* practice (when it serves research purposes). While enduring and persuasive, this triad raises difficulties from the point of view of the present paper in that it licenses the use of the term "research" in situations that do not meet the minimum conditions defined for research outlined above. The generation of ideas and insights through a design process cannot be considered research if it does not attempt to contribute to the existing stock of knowledge within a scholarly community.

As an effort to cohere several strands of research and practice in the 'human-centred' creative design tradition, a framework proposed by Sanders & Stappers (2008) can be read as an attempt to consider variants of practice and research in design within a broader landscape. Their framework has two axes—"led by design"

versus “led by research”, and “user as subject” versus “user as partner” (p. 6)—outlining a field within which specific contemporary “human-centred” design research variants (e.g. “critical design”) are located. While widely cited, the framework reveals the difficulty of identifying the basis on which projects, methods and even individuals may be regarded as being primarily “led by design” or “led by research”. As a result, the analysis does not serve the purpose of distinguishing practice research in design from *design practice*.

A more recent contribution is Laurene Vaughan’s edited collection of 2017: *Practice-based Design Research*. Although this offers no overarching consensus about how practice research in design can be assessed, articulated and communicated *as research,* many of the papers published in this volume suggest interesting trajectories with respect to practice research and design (notably, Markussen, 2017; Binder & Brandt, 2017). Binder & Brandt offer a decisive solution to the predicament identified in Frayling above, by insisting that research and design practice be distinguished. They argue that:

> Our suggestion is to see design research practices as fundamentally homologous to any other design practices, both in terms of the way they are driven forward by a dialectic between programme and experiment and in how they actualize potentialities through experientially manifesting ‘the possible’. This does not mean that design practices are in themselves research practices. Research practices must be answerable to a research question or concern that resides outside the programme. (Binder & Brandt, 2017, pp. 101–102)

Thus, they are able to distinguish between projects in design that are practice research and those that are not, but only at the cost of suggesting that research questions originate outside of a design programme (see also Brandt & Binder, 2007).

Koskinen, Binder, Redström, Wensveen & Zimmerman’s (2011) *Design Research Through Practice: Lab, Field and Showroom* offered a typology of forms of design research, with distinct characteristics, each with its own institutional location and parameters. Building on traditions in Scandinavian design research (e.g. Ehn, 2011) rooted in the constructive approach to epistemology, Koskinen et al. introduced the idea of “constructive” design research. This refers to “design research in which construction—be it product, system, space or media—takes centre place and becomes the key means in constructing knowledge” (Koskinen et al., 2011, p. 5). As a version of ‘thinking through making’, a term widely used by professional designers (e.g. IDEO), such constructive research can be read as ‘design to know’ in that it is through designing/making, and the consideration of made things in social settings, that new insights and understandings are generated. Once entangled with a community of peers and a body of knowledge—whether through the institutional formations of laboratory, field or exhibition showroom that Koskinen et al. specify—such constructed knowledge (and its associated material artefacts) finds its community, beyond the context of its generation.

Also emerging from the Scandinavian tradition of research, Simonsen, Bærenholdt, Büscher & Scheuer’s (2012) *Design Research: Synergies from Interdisciplinary Perspectives* presents a similar view. Simonsen et al. argue that the priority is to

understand the process of designing as knowledge construction as well as solutions construction. Here, again, it is through the activity of making and refining "solutions" that knowledge is materialised and generated, marking out a distinctive form of knowledge production in which material artefacts are closely implicated. Perhaps somewhat paradoxically, while reaching out to other disciplines and frameworks intentionally to find the means of making knowledge in design more generalisable, ultimately, they observe its distinctiveness.

Other scholars in design have tried to address the challenge of showing how the process of designing results in new knowledge that can be communicated. Niedderer's (2022; see also Niedderer & Roworth-Stokes, 2007) starting point is to revisit the concept of "propositional knowledge", understood as justified true belief, as it is contrasted with "non-propositional" knowledge, thus the forms of procedural and experiential knowledge. Niedderer argues that experiential knowledge underpins both propositional and procedural knowing. Moreover, she argues that propositional knowledge contains non-propositional content and vice versa, and that tacit knowledge has aspects that can be expressed in propositional terms. This, Niedderer claims, offers a way of "revisiting the role and format of knowledge in research, in particular of tacit knowledge, with regard to its inclusion and communication" (2022, p. 250). Her approach is useful in that it engages with external definitions of research and validates tacit forms of knowing as part of propositional knowledge. However, the proposal is less effective when it comes to demonstrating the "surplus" unique to practice research that is not adequately captured by existing definitions of research, which privilege propositional knowing. Here, Neidderer acknowledges that, while "the propositional content part of non-propositional knowledge can be made explicit, the tacit part cannot, and the acceptance of it as satisfactory evidence within research may rely on pointing at, and sharing of, a common understanding and interpretation of, the tacit content" (2022, p. 250). Thus, relying as it does on the notion of tacit knowledge, the proposal still risks consigning parts of the distinctiveness of practice research to the realm of the ineffable.

Building on these contributions, there are opportunities to define more precisely what is produced by and through practice research in design by using a theorisation of design advanced in studies of engineering design. In what is known as C-K theory, Armand Hatchuel and colleagues (Hatchuel et al., 2009; Le Masson et al., 2010) propose that, through designing, new concepts (C) and knowledge (K) are produced. For these theorists, unlike knowledge (K), a concept (C) is neither true or false; it simply is. Through a dialectic, not in parallel, the mutual interactions between C and K result in new articulations expanding beyond what was there before. New knowledge prompts the identification of new concepts, while the elaboration of these results in a search for new knowledge. This means that producing new concepts, through the creative work of designing, is part of the knowledge production process and vice versa. Put another way, it is through the expansion of the C-space alongside the K-space that designing proceeds.

Using C-K theory solves the problem of how to understand the knowledge and concepts created through practice in design. Rather than categorising such knowledge as heuristics or tacit, and thus difficult to judge via the current standards for research, C-K theory allows us to take seriously the concepts (new designs) produced through designing, but to distinguish them from new knowledge. The role of the artefact in design research therefore is clarified. Instead of having to bear

the weight of 'being' knowledge, artefacts can be analysed for the extent to which they embody new concepts (or designs) or contribute to the generation of new knowledge in the expansion processes associated with designing.

These considerations connect with the earlier discussion on constructive knowledge production, which emphasises the making of and engagement with artefacts to produce new socio-material things (Binder et al., 2011). Building on this, we can now begin to delineate a materialising, design-oriented form of research that results in the construction of new concepts (or designs) alongside, and inextricably connected to, the construction of new knowledge, in which material artefacts play an important constitutive role.

7. Towards a new foundation for practice research in design

7.1 Key considerations underpinning the proposed frameworks

Through the discussion of discourses where the use of the term "practice research" has been established, we have identified some points of convergence, which lead us to three key claims. First, there is the importance of **situational understanding** and analysis to make sense of practice research. This is a specific mode of knowledge acquisition that derives from the fact of practice research being **situated:** it relies on experiential and direct acquaintance with the contexts in which knowledge is produced. It has to be explicated in relation to these contexts, calling for a specific form of "context-based, process-oriented description and explanation" (Andersson, et al., 2003, p. 50). And, unlike other research paradigms where the expectation might be that the research process does not interfere with the situation, in practice research the opposite is true: the context is changed somehow by the research. In the context of design practice research, there is an additional emphasis on *materialised solution and knowledge construction* taking place in a specific situation. Dewey's term "situational inquiry" has been applied to design research (Dixon, 2020), meaning a process of situational transformation through the refinement of ideas and action (Dewey, 1938). Situated forms of knowledge production are different from theory building in basic research because of how they are carried out and what they achieve. This is reiterated throughout all the literatures we have reviewed across education, health, management, the creative practices and design.

The second claim that practice research in general, and thus including design, is to be understood in terms of **networked knowledge production.** The 'clues' to what is and is not research are not to be found exclusively in the particular manifestations of practice research, but rather in the institutional discourses and institutional logics grounding their production and assessment. Building on the institutional theory of art (Danto, 1964; Dickie, 1974) and the idea of institutional "ecosystems" embedding and organising practices (Powell & DiMaggio, 1983), we argue that it is not enough to take an emic perspective and capture the particularities of the specific instances of practice research. Rather, in order to understand why some

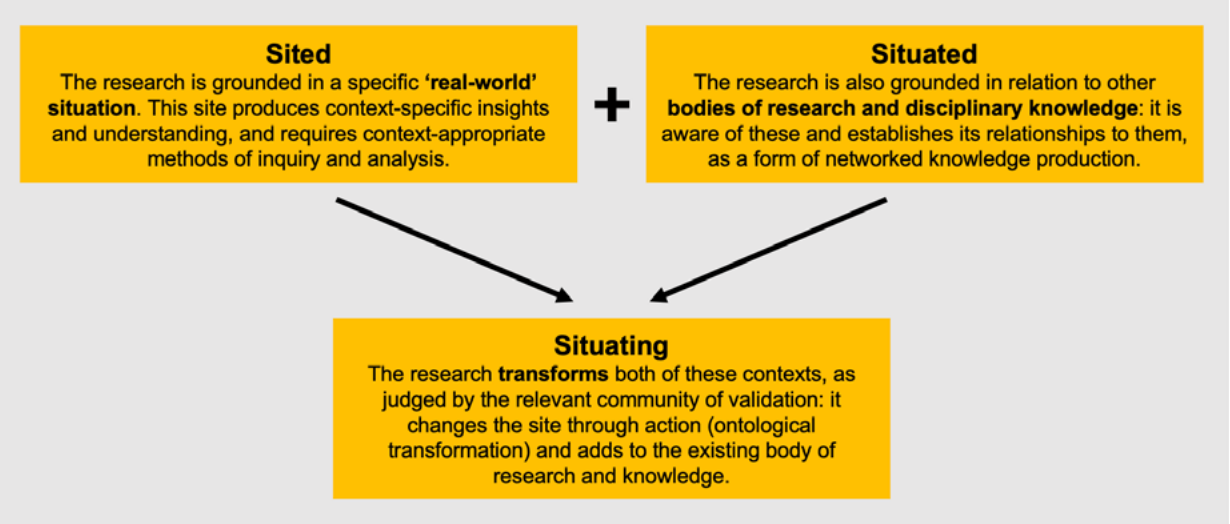
but not all instances of practice are *research*, we need to understand "*supraorganizational patterns of human activity"* (Friedland & Alford, 1991, p. 243). With design practice research, this means locating design in relation to relevant publics and (academic) contexts, which, in turn, allows the production and assessment of new knowledge claims alongside new objects (e.g. Koskinen et al., 2011).

The third claim is that the assessment of practice research is a form of practice in its own right that calls for an appropriate **community of validation**. This is because the criteria for the assessment of practice research cannot be fixed. The review of literatures across different domains suggested the notions of "communities of inquiry" (Dewey, 1938) and "communities of practice" (Lave & Wenger, 1991). Across medical research and practice, participatory models are emerging in which stakeholders agree on their goals and apply their collective knowledge, skills and resources to accomplish these goals (Mold & Peterson, 2005). Specific methodological approaches in community-based participatory research (CBPR) (Macaulay & Nutting, 2006) have been proposed, as well as efforts to understand academic-practitioner relationships and the implications these have for research (Bartunek & Rynes, 2014). In education, parallel conversations are taking place, asking about assessment criteria appropriate for practice research (Furlong & Oancea, 2007). Collectively, this suggests a different model of accountability where research is answerable to a relevant and diverse **community of validation** that understands both the conditions of practice as well as research. The proposals made in this paper are meant, among other things, to assist the development of a new peer review system capable of assessing practice research without importing standards uncritically from the established discourses largely grounded in the understanding of research in science, technology, engineering and mathematics (STEM) subjects, or relying on assessment criteria that are immutably fixed as something capturing the essential qualities of practice research.

7.2 The 'Triple S' scheme: three conditions for practice research

Building on the three claims outlined above, we therefore propose three conditions of practice research. We use the term conditions, rather than principles (e.g. Vear, 2022) or definitions (cf. Bulley & Sahin, 2021), because we do not assume that there are universal, essential or sufficient properties for something to be practice research, as this is a historically contingent and variable construct. Nor do we believe the field requires principles to regulate practice. Rather, based on the state of the art across different contexts and domains, we note some distinct conditions that are being met in the actual activity of practice research. The Triple S scheme presents three conditions that, if met, suggest something can be considered *practice research*, as opposed to *practice* or *research*.

So, *practice research* is different from *research* in that it is *sited* in a real-world situation from which insights and knowledge emerge; it is different from *practice* because it is *situated* in relation to a body (or bodies) of academic research; and it is *situating,* because it produces objects as well as knowledge and results in 'ontological transformation': the world is changed somehow as a result of the research.



↑ **Figure 2. The Triple S framework.**

7.3 Towards a new characterisation of practice research in design

We now turn to the task of characterising practice research *in design*, assuming the three conditions in the Triple S scheme have been met. Following Hatchuel and colleagues (Hatchuel et al., 2009; Le Masson et al., 2010), we propose distinguishing between two irreducible but interrelated products of practice research in design: first, new *concepts* (or designs) and, second, new *knowledge*, adopting the distinctions made in C-K theory outlined above. We see new concepts and new knowledge as relationally articulated and unfolding within three domains:

- The *site* or issue domain that the practice research addresses, with its attendant community of validation and body of knowledge

- The domain of current design practice—the doings and sayings of those involved in designing in their institutional settings in relation to a community of validation and body of knowledge. Here, we adopt a practice orientation (see section 2) to analyse design, recognising its contingent, situated characteristics—adopting Kimbell's (2011) term "design-as-practice"

- The domain of *design research* itself, understood as a situated, knowledge-producing practice with a related body of disciplinary knowledge and communities of validation. As we have shown, this is in formation and located in varying institutional settings with different genealogies including universities as well as art schools.

Table 1 summarises these intersections, to show the specificities of the concepts (or designs) and knowledge produced through design practice research in each of these three domains.

What is produced through practice research in design	For the site/issue	For design-as-practice	For design research
Concepts/designs	Innovations, solutions, inventions or artefacts for the situation and community	New ways of doing design practice, e.g. new or improved design methods	New ways of doing design research, e.g. new or improved research methods
Knowledge	New understandings in relation to a body of knowledge and academic community of validation	New understandings of design-as-practice, in relation to extant academic work	New understandings of design research, in relation to extant academic work.

↑ **Table 1. Design Practice Research Outcomes analytic framework: contributions of practice research in design.**

Having outlined what is produced through practice research in design (new concepts/designs alongside new knowledge) in three settings (the situation, design-as-practice and design research), we propose the following operational definition of practice research in design:

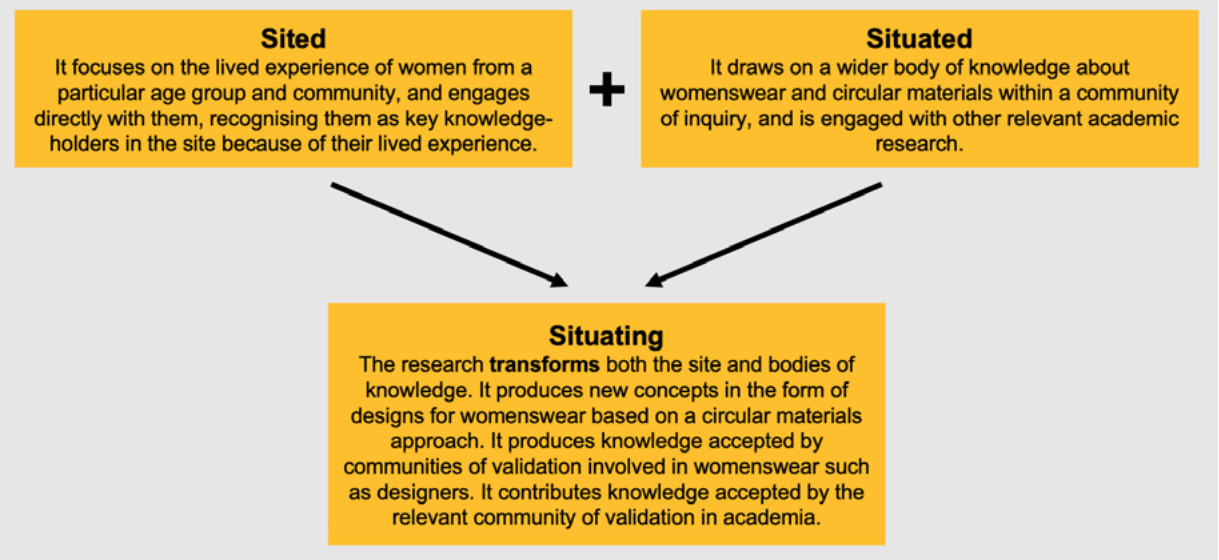
> Practice research in design is a form of networked, constructive knowledge production and practice development. It is carried out through inquiring into situations, informed by domain- and discipline-relevant knowledge and in relation to an appropriate and relevant community of validation. It results in the production of new concepts/designs and new knowledge, relevant to and for assessment by the community in the situation, as well as in new concepts/designs and new knowledge for design practice and for design research, relevant to, and for assessment by, design practice and research communities.

This way of characterising practice research in design is consonant with institutional definitions of research, such as those promoted by funding bodies, as well as the conditions of production of practice research. Practice and acting in the world (doing, intervening, changing things) are recognised here as imperative and intertwined, but so too is the contribution to the existing stock of knowledge and the engagement with existing scholarly debates, processes and infrastructures associated with communities of validation. Accepting the established, institutionalised definitions of research does not mean putting practice research in design into a straitjacket that does not fit. Rather, it is the prerogative of the community of validation to articulate tailor-made criteria and standards to assess practice research. In this spirit, the claim of this paper is that the Triple S conditions allow appreciation of some of the 'peculiarities' of design practice research, while the Design Practice Research Outcomes analytic framework helps make clear what distinguishes practice from practice research in design.

7.4 Worked example

To bring this discussion to life, we offer an illustrative example of a design practice research project, mapped across the scheme and the framework we have proposed. In this example, a designer-researcher with expertise in fashion and circular materials is carrying out practice research in the domain of womenswear, focusing on older women from a particular community.[5]

This project is:



↑ **Figure 3. Worked example: examining the Triple S conditions of practice research.**

Through this inquiry, the designer-researcher produces new designs (concepts) and new knowledge for the situation, for design practice and for research as follows:

	For the site/issue	For design-as-practice	For design research
Concepts/ designs	New prototypes and proposals for clothing for older women using a circular materials approach, informed by the insights into the domain and by academic knowledge	The development of a new method to allow women to explore and respond to prototypes, accepted by a community of practice	
Knowledge	Insights into the domain relevant to a community of inquiry, e.g. new knowledge about the lived experience of older women, how they relate to their bodies and their clothes		Theoretical developments explaining how ethnographic inquiry can be incorporated with the existing thinking about participatory engagement in design, accepted by the community of validation in academic research.

↑ **Table 2. Worked example: mapping the Design Practice Research Outcomes.**

(Note that, as in this case, there may not be a complete set of outcomes across all six cells of the matrix.)

Conclusion

The aim of this study is to make a decisive contribution to contemporary debates about practice research in design. The discussion takes place at a time when design researchers, including doctoral students, make claims to be generating solutions as well as knowledge in relation to climate injustice, social change and public policies, among other things. While welcoming the potential for design research to play a significant role in creating change, as well as recognising that design is becoming an established academic area, we suggest that advancing clarity about practice research in design will aid better articulation and public understanding of its specific possibilities and constraints. In a more limited but important way, clarifying the nature of research contributions attributed to design practice research can inform the ongoing debates concerning the allocation of public investment to different areas of research, knowledge exchange and innovation.

To these ends, the paper reviewed some other academic disciplines where practice research prominently figures: education, management, health and the creative arts as well as design. This review is underpinned by a quest to identify what these different discourses have in common with respect to practice research, and whether some contours of the object of investigation can be discerned beyond disciplinary silos. The three points of convergence—the features that the characterisations of practice research share across different disciplines—identified in this paper are: **situated understanding, networked knowledge production and communities of validation**. The first of these terms refers to the delivery mode of practice research and emphasises that its focus is acting in specific situations as a way of binding together thinking and doing. This is well accepted across the discourses reviewed, including in design. The second term casts practice research in the context of institutional ecologies that ultimately define what counts and what does not count as practice research. Practice research is seen here as a construct constituted by the interplay of competing institutional logics, rather than a stable object of analysis with fixed and immutable characteristics. With regard to the third notion—communities of valuation—recognising the historically contingent character of practice research means that, rather than postulating immutable criteria, the assessment of practice research calls for a community of peer reviewers capable of reaching judgement about the relevant features, qualities and attributes.

The institutional understanding of practice research proposed here, however, does not mean that it cannot be successfully characterised, classified and analysed. This is expressed in the classificatory scheme proposed: the Triple S conditions setting the need for practice research to be **sited, situated and situating.** Collectively, these conditions distinguish practice research from basic practice as well as from basic research. This classificatory scheme is the basis for the Design Practice Research Outcomes (DPRO) analytic framework, which breaks down the contributions made by practice research in design as: concepts (**designs)** and **knowledge,** within three contexts: **the site/issue, design-as-practice** and **design research.** This presents a new foundation for understanding and assessing the outcomes of practice research in design. The Triple S scheme and the DPRO analytic framework are integrated in an operational definition of practice research in design.

The proposed approach does not attempt to define practice research in essentialist terms as having necessary and sufficient properties intrinsic to itself, nor does it assume that there is a set of fixed criteria—be it rigour or excellence—that can be applied to all historically variable manifestations of design practice research. Rather, it is seen as institutionally and discursively circumscribed and so contingent on the changing contexts. It is a "family resemblance" (Wittgenstein, 2010 [1953]; Kaszynska, 2021) concept that is made intelligible because of the *de facto* overlaps rather than some underpinning unitary strand. In this way, the paper overcomes the limitations of some existing frameworks, which remain preoccupied with scrutinising practice research, hoping to discern its 'essential' properties—and, when these are 'found', define these as 'tacit'.

In terms of limitations, the paper does not look closely at the aesthetic aspects of practice research in design and how these might shape contributions to knowledge and practice development, an important oversight given the emphasis on materialisation and experience in studies of and practice in design. Nor does it engage substantially with some of the closely related explorations of practice research in the arts. Further, given the multiple claims of design research to address 'social' issues, further work would benefit from exploring relations between design and social research.

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Endnotes

[1] This is not to ignore the practice research in design happening outside of academia, for example, in community groups, civil society organisations, businesses, public sector or government bodies, or design consultancies; but our focus here is on articulations in higher education settings.

[2] https://designmuseum.org/learning-and-research/design-museum-rd/future-observatory

[3] https://www.lexico.com/definition/research

[4] Note: we interpret Candy's (2006) use of the term "outcome" to mean the creative output, e.g. an artwork or performance rather than the more abstract outcome of 'knowledge'.

[5] This example has been inspired by the doctoral research of Kadian Gosler at London College of Fashion: "Smart Bras: Developing an Experience-Centred Bra Wearables Design Process".

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