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EDITORIAL:

The In, Through and About of the Design PhD

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This seventh number *Cubic Journal* was originally conceived to capture emerging discussions about the contested roles of PhD design and a design PhD and was fuelled by the experiences of COVID-19.

In April 2019, the academic publisher Springer Nature unveiled what *The Verge* (Springer Nature Group 2019) reported as being 'the first research book generated using machine learning'. This marked a significant moment that signalled 'a new era in scientific publishing' by 'automating academic drudgery' (ibid). At the same time, the McKinsey Group (McKinsey & Company, n.d.) reported a surge in business innovation that has impacted all sectors of the economy beyond only healthcare. How knowledge is conceived and produced and how the knowledge economy is being reshaped have continued apace.

During the COVID-19 pandemic, communication, learning, research and many everyday workplace activities moved online, and although academic communities worldwide continued to operate, many irreversible changes occurred. COVID-19 exacerbated many health and human inequalities, changed interpersonal relationships and reshaped perspectives and priorities regarding research, knowledge conception, production and practice, particularly the relationship between knowing what and knowing how and/or why.

In looking to the future and to the role and purpose of tertiary education, the practices of research and our interpersonal and international relationships with one another, other species and other forms of artificial intelligence (AI) will be vital, albeit different. Much research has still to be conducted on the challenges individuals and societies will face as new forms of AI increasingly challenge our own judgments and reshape how we conceive of research and work – that is, how we interrogate decisions, make judgments and learn what we can trust and what we might question as these technologies become ever more sophisticated and responsive in intervening in our daily lives the world over.

Whether and how we can learn, develop, live well and continue to shape and share the evident potential of AI and generative AI in virtuous and complementary ways remains to be seen, which suggests the need to exercise, evolve and strengthen our human capabilities, compassion, creativity, courage and collaboration and ensure that we can maintain a productive equilibrium between cognitive, emotional and artificial intelligence for future generations.

Over the past two decades, the PhD has become a global shorthand, an essential qualification for a career in academia and a benchmark against which all other qualifications are awarded. This contrasts sharply with the shift observed since the early 2000s that has emphasised a master's degree as the minimum qualification for a career in higher education. Over the past 25 years, the PhD has emerged as a significant benchmark, supplanting the master's and establishing a PhD-centred focus as the 'new normal' for any academic career. This has resulted in two outcomes. The first is that, in certain contexts, the PhD has become an age determinant, necessitating those who wish to teach to achieve a PhD qualification before they reach 40 years of age.[1] The second outcome is the development of more systematic and structured connections to the final 'capstone' or master's work, and redefining such projects as research or 'proto-PhDs' prior to commencing doctoral study, thereby reshaping both the entry and definition of PhD study internationally.

This has many implications, including driving up the demand for 'fast track' or alternative doctoral routes or equivalences, often at the cost of giving doctoral candidates time to develop mature research skills, knowledge and competencies to support their careers and futures. PhD candidates are, in many circumstances, expected to support their supervisors' research programmes in unregulated research apprenticeships without the governance and quality measures that provide equitable agency to scholars and supervisors alike.

Doctoral models have also proliferated alongside contested debates about what constitutes a PhD, particularly as colonial structures of tertiary education, forms of knowledge and its communication have all come under scrutiny and the idea of doctoral 'equivalence' has expanded. For example, this has involved loosening and changing admissions protocols as well as limiting quality assurance or enhancement, the development and oversight of contemporary research knowledge and competencies and supervisory practices and examination processes, including how and who establishes the PhD research questions that traditionally drive doctoral projects. Globally, although the PhD is generally classified as the highest degree awarded in tertiary education, it remains the least regulated and potentially the most diverse in terms of quality and standards. These conditions have led to variable expectations of doctoral education and to quite extreme differences in the capabilities and outcomes of doctoral graduates.

In the broadest terms, the criteria[2] that define a PhD include demonstrating the following:

1. A systematic understanding of a field of study and mastery of the skills and methods associated with that field.

2. The ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity.

3. An ability to contribute through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits refereed publication, either nationally or internationally.

4. Critical analysis, evaluation and synthesis of new and complex ideas.

5. An ability to communicate with peers, the larger scholarly community and society in general about one's area of expertise.

6. An ability to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge-based society.

7. An ability to undergo the universally accepted but not prescribed requirement of rigorous examination to attest to the veracity of the findings of one's body of work.

This list already problematises the doctoral qualification, as the PhD does not provide assurance of the ability to educate, communicate knowledge to others effectively or deploy or apply research in the world or for the 'public good', which is increasingly central to the demands of contemporary publicly funded academia.

Although the philosophiae doctor, now termed the PhD, originally stemmed from a broader meaning of the 'love of wisdom' and the exploration of knowledge primarily for its own sake, a modern university in the nineteenth century (Humboldt) was the first to structurally link teaching and research by awarding a modern PhD degree. This degree required evidence of original research or insight – which is the recognisable and defining element of most doctoral degrees today.

In concert with the rapid rise of generative AI and the growth of design- and practice-based doctoral programmes, there have been persistent debates about what constitutes a PhD and whether the current frameworks that define and shape knowledge and, hence, doctoral study remain fit for purpose, not only to support future academics, educators and, consequently, learning experiences for new and subsequent generations of students but also to enable and conduct quality research internationally and to translate and apply it, whether in business

and industry or in shaping policy and supporting societal change.

In light of these debates, the collection of papers in this issue outline a range of conditions, perspectives and views regarding the PhD as a contemporary terminal degree, with a specific focus on design and creativity.

These papers examine how and where design is located and understood within a PhD, be it as the putative subject and content of study, as a constituent practical and/or experimental element in the process of conducting a PhD or as an intrinsic part of the doctoral structure of a PhD's methods, its methodological framing and the overall design of the research to be conducted through the development of a research proposal and its execution. There are inevitable and welcome differences between these as well as a series of common themes and elements that open up potential opportunities for innovative doctoral development.

In inviting these discussions, this volume always intended to capture these ideas and their application, the various deployments of design and what such reflections may offer the evolution of the PhD and its future form and purpose. From different perspectives, all of the essays reveal the opportunities and challenges of existing and historical doctoral structures. Such discussions are in their infancy, and as both **Navarro** ('Discussions on the PHD in Art and Design with Annotated Bibliography') and **Brezek and Wallen** ('Some Notes on Past and Future of the (Practice) PhD') helpfully outline, there are many competing justifications and critical perspectives on the emergence and purpose of the PhD, as discussed by **Lavi and Friedman** ('Notes on the Value of a Design PhD'), and there is potential for alternative doctoral models for both art and design (**Boomgaard**: 'Breaking Water with Bare Hands'). What is also notable is a common desire for and recognition of, albeit expressed in different ways, the need to move beyond static, individualistic and formulaic 'traditional' PhD models and to recognise the PhD as an opportunity – arguably the best opportunity – to shape a social, discursive and collaborative model for active, engaged scholarship, quality research, researcher development and enhanced supervisory practices.

As some of the authors suggest, there is a growing desire to reflect on doctoral models that can accommodate learning, practice, the evolving 'craft of research' and research expertise alongside societal impact (**Espeland**: 'The PhD Dragon: Can It Be Tamed and Trained Through Dynamic Educational Design?') as well as the concomitant need for both reflection on and the application of research skills and knowledge in action, whether by socialising an interdisciplinary research community, studio or laboratory (**Alvelos**: 'Unlikely Bridges, Unexpected Circumstances') or by facilitating opportunities to move more fluidly between academia, practice and industry (**Koskinen**: 'Beyond Practice Based Design'). The interdisciplinary experiences of two design-focused PhDs are articulated in papers that outline in more detail the process of designing and working through the PhD experience and deploying design dynamically: first, in the context of health (**Walker**: 'How Did I Get Here?'), and second, in the conceptual framing and experience of an industrial PhD collaboration between the CITA Research Laboratory at the Royal Danish Academy and the Danish textile company Kvadrat (**Thomsen and Honour:** 'Designing Design'). Although both are complex and interdisciplinary, they capture the dual need to ground conceptual and theoretical experiences in practice and, equally, to reflect on and analyse experiences through a conceptual and theoretical holding form, such as **Thomsen and Honour's** 'Conceptual Wunderkammer'.

In 'Designing for Responsible Innovation in the AI Era', **Wang and Xu** directly confront the spectre of AI and design as well as considerations of designing for 'responsible innovation', including, as they note towards the end of their paper, surfacing the

importance of stepping up to the responsibility and ethics of future design research as generative AI and new technologies lead or drive us into new and different ways of being, thinking, behaving and producing trusted research.

Generative AI is one of a plethora of analytical research tools now at our disposal for undertaking research. Its use is now common and challenging for many design-based doctoral candidates who are unfamiliar with, for example, statistical or textual analysis or with new ways of utilising and conducting data searches or literature reviews.

The acceptance and extended use of a greater range of analogue, digital and technical tools in research have been enlightening and invaluable in diversifying and opening up new research vistas to many, especially in recent years in creative fields. However, discussion and support for their inclusion and effective use as analytical research tools have, until recently, been accepted as part of the evolution of research, with their efficacy only interrogated more fully at the doctoral level.

However, the emergence of AI raises a new, arguably more existential spectre for research regarding AI's role in both the design and conduct of any doctoral project and how it will be accommodated, referenced and accounted for in the research process and the conception of trusted research, in thesis examinations and in the postdoctoral and career development of all researchers.

It is also unsurprising that as the tools and technologies of research environments have expanded and generative technologies have risen in prominence, so too have discussions and concerns about trusted research and integrity. Globally, there is a greater level of interest in and scrutiny towards not only what is being researched but also the efficacy of wider research ecosystems and how research is being conducted, documented and disseminated.

Beyond immediate ethical considerations, research integrity raises questions about the environments and systems that support research, safeguard and enhance good practice (rather than hinder it) and shape what may be described as the 'research culture' within which PhD candidates and early-career researchers are inculcated.

It remains in the gift of experienced researchers (and is arguably their responsibility) to promote and advocate for open and trusted research and explain, consider and contribute to the responsible and future governance of such research. Similarly, research institutions must critically examine how research integrity is governed in an era dominated by league tables, rankings, and generative AI technologies. These tools risk incentivising perverse behaviours, creating unequal global access, standardising knowledge at the expense of diversity, and prioritising quantity over curiosity, care, rigour, and quality.

The development of appropriate research skills for the interrogation and use of 'design' in a 'design-based PhD' and research 'design' skills for embarking on a programme of investigation are essential for doctoral candidates. These may require more fundamental reflection if the core purpose of doctoral education is to remain unchanged. These skills are frequently acquired serendipitously and may or may not be tested as part of the doctoral viva or through an examination of the doctoral thesis. Given the array of challenges outlined above, perhaps now is the time to reflect on and reconsider the purpose, length and form that doctoral education might take in future decades and how we prepare and support our PhD candidates and early-career colleagues in shaping their careers.

The essays reflect the tactics and strategies deployed to navigate institutional frameworks and regulations that are perceived as constraints in developing different forms of 'new knowledge or insights' in or by design and how they align, resist or reshape scholarly models and paradigms

in potentially new ways. Until relatively recently, the form and structure of generic PhDs remained relatively static in terms of the thesis, anticipated knowledge production, skills and outcomes, albeit through an entanglement of regulatory and funding mechanisms, methods, systems and processes.

However, over the past three decades, and as a complement to solely text-based thesis formats, other equivalent forms of doctoral study and production have been adopted in both architecture and design as well as in the creative and performing arts. These taught, practice and 'professional' models offer the potential to draw on international good practices, bring European and American doctoral models closer together and include different forms of knowledge and research practices from across Asia and the Global South (**Low**: 'The So-Called Creative PhD') in reflecting on contemporary doctoral studies and their fitness for future purposes (cf. Koskinen).

Given the changing nature of the PhD and the proliferation of equivalent qualifications, it is essential to remain focused on the purpose, definition and outcomes of a design PhD, which primarily reside in achieving an understanding of and the ability to undertake independent research in a contemporary context. In so doing, one can distinguish between research, as the development of new insights or new knowledge in a prescribed and articulated field, and learning, development and the advancement of knowledge in an individual.

Although the current standard definition and purpose of a PhD provides a useful starting point for understanding contemporary doctoral design studies globally, it is increasingly important for candidates, supervisors and employers to define more precisely the threshold capabilities and competencies anticipated at the point of graduation, such that the doctoral and postdoctoral opportunities for any individual are explicitly (rather than implicitly) evidenced, demonstrated and addressed as core responsibilities of research institutions to assure doctoral quality. The implications for research culture are significant.

Traditionally, academic career development has loosely been understood as 'custom and practice', and postdoctoral opportunities and continuous professional development at all career stages have tended to be serendipitous, rather than being seen as a collegiate responsibility and an expected contribution to academic citizenship and to fostering a supportive research culture.

Moreover, the contemporary reality is that many doctoral opportunities are the result of competitive project funding and driven by the cultures of 'publish or perish'. This undermines research integrity and tends to incentivise production and citation over quality research and knowledge production, rather than ensuring all supervisors to take responsibility, demonstrate leadership and contribute to the broader academic project. Recognising and taking the responsibilities of quality supervision seriously is vital to the sustainability of quality research, of PhD programmes, and ultimately of the health of our research ecosystems, cultures and environments.

The role, purpose and contributions of doctoral student communities in academia are often not acknowledged or appreciated either in terms of their intrinsic value or the mutual benefits for graduates and the research culture of institutions. especially in terms of attracting and retaining doctoral scholars. Beyond considering the doctorate as a 'research apprenticeship', both communities could gain considerably from actively harnessing external and international networks. This could also include developing the skills and competencies to network, translate and communicate research and work collaboratively with policymakers and industrial partners to make a societal difference, thereby extending the usefulness of the PhD beyond a threshold solely for a career in academia (cf. Espland).

Expanding the role and purpose of doctoral communities also allows an opportunity to reflect on the effectiveness and contested nature of research studies in design (see Koskinen) and how design is deployed, in the context of a design PhD and beyond, in the design of a programme of research. Simply put, design gives form, structure and meaning to an idea, and, in the context of a PhD, in the definition of a question and a means to respond to it.

In a design PhD, it is essential to distinguish whether the study will deploy design as a method or as part of a methodology (through design) or in response to a research question that may or may not be associated with a design solution. This may be done to interrogate a critical or historical aspect of design itself (into or about design) as opposed to the production of a design solution (whether artefact, system or process), which is generally formed from an array of accumulated (systematically or otherwise) existing bodies of knowledge, know-how, information and materials, to produce 'a design' as an outcome (for design). It is the latter 'for design' that frequently challenges the veracity and credibility of a doctoral design project as a valid programme of research without the underlying demonstration of a rigorous and systematic literature review and a clear demonstration of the research challenge.

Design research is often complicated by the more general need to design and develop a research programme. It could be argued that a core skill for all doctoral candidates is the design and planning of their PhD in giving form, structure and meaning to an idea (hypothesis) and its subsequent implementation, development, iteration and delivery.

In general, a doctoral project is constructed through a literature review or an equivalent scoping of the putative field of study, a series of systematic experimental or iterative actions and activities, reflections and analyses and the articulation of a series of findings, insights and/or understandings. In doing so, candidates may also identify the counterpoints, risks, strengths and weaknesses of the chosen processes, methods and methodologies and how future research in the field might be conducted. Both Walker and Thomsen provide glimpses and insights into the opportunities that a design PhD and the intelligent use of design in shaping doctoral studies offer.

Often, in the presentation of design PhDs, these two interdependent tracks become conflated. The opportunities that design offers for reflexivity and for enriching doctoral studies more broadly are frequently overlooked or ignored. Instead, a transactional, pattern-book approach tends to dominate, neglecting the potential for opportunities and enrichment that such processes provide. These processes are vital for recognising and advancing research as a social practice, integrating individuals into academic communities of practice, and validating research through evidence and practical application.

Historically, the design and the associated design learning and development involved in this process are assumed, taken for granted, overlooked or formulaic. The design of a design thesis is generally established in dialogue with a small supervisory team, often without candidates having knowledge of or full access to the array of possible research methods, ideas and tools that may inform and shape their research processes and their wider subject knowledge through various taught components (**Nesteruk**: 'Structures and Mappings').

For those undertaking cross- or interdisciplinary design-based projects, access to taught components and specialist disciplinary methodological guidance are invaluable when venturing into new fields and subjects that may fundamentally alter perspectives and introduce new forms of language but, equally, challenge the nature and/or form in which knowledge is accessed, documented, analysed and disseminated. Within this volume, Low, Brejzek

and Wallen and Koskinen all raise questions about research design and the conception, construction, representation and communication of knowledge in the context of the doctoral project and where and how these might be usefully integrated within doctoral education, much as they are in the USA.

Clearly, although specifically discussed here in relation to PhD studies in design, the challenges of research design and integrity across disciplinary boundaries are becoming increasingly relevant as interdisciplinary and translational research tackles ever more complex global challenges. These challenges require many different forms of theoretical and practical knowledge and expertise to give form and meaning to the research and the plethora of questions and solutions required to tackle the world's health, environmental, economic, technical, social and cultural challenges.

This suggests opportunities for design researchers both present and future as well as a need for a more reflexive approach as to how doctoral education and the development of new generations of design researchers are prepared for and can actively contribute to future research design, its implications and its impact.

Although doctoral studies have evolved since the emergence of the modern PhD in the nineteenth century, research design, design research and design PhDs are relatively recent. As these essays demonstrate, design (and creative PhDs more broadly) introduces potential new insights and new ways to develop, interrogate, share and represent knowledge and the need to think and act beyond text. These new means have been illuminated and supported by digital and technological advancements, including, more recently, by the emergence and rapid rise of generative AI, accelerated by the global shock of COVID-19 and increasing recognition of the need for interdisciplinary research to tackle common global challenges, the enormity of which are often abstract and overwhelming in their scale and complexity.

In this context, as Espland and others suggest, a consideration of the impact and purpose of a programme of research (as opposed to its findings) is helpful in shaping the design and nature of the question, its field or fields of enquiry and its potential research and societal contribution. Together, these provide a virtuous nexus for design at the intersection of reflexivity and praxis (Nelson 2013; Freire 1970); in other words, between self-reflection and enquiry (scholarship), beyond the self (research) and between theory and practice.

Beyond the entry qualification for a career in academia, there are opportunities for advancing doctoral design studies and communities of practice and developing the skills, knowledge and capabilities to sustain both research and pathways to impact. The growing use of AI and big data and the introduction (and seduction) of new analytical tools, digital technologies and search engines that accelerate access to an array and volume of information are both stimulating and equally a challenge to an expanded, more inclusive view of original insights and the production of new knowledge. In considering research as the generation of new ideas and new knowledge, existing and emerging design researchers have a responsibility to counter the potential colonisation of and by research ecosystems that are geographically and intellectually limiting and exclusionary, discoverable only via 'big data', AI and digital tools, by strengthening critical competencies that are specifically human.

On reflection, and in compiling this issue under the title 'PhD Design and Design PhD: In, Through and About', it is clear that there are still many valid and important questions about the incremental next steps and the value of the doctoral experience and its outcomes. Through doctoral education and bringing together design researchers and an expanded portfolio of research design opportunities, there is the potential to rebalance and strengthen human capabilities that complement and counteract emerging technologies that can

limit our agency and ability to think, wrestle with and give form to ideas as well as balance our capacity to develop both IQ and EQ.

This collection of papers is only the beginning of how doctoral studies and design training can evolve, contribute to advancing research and develop the capability, collaboration, compassion, creativity and courage that distinguish and highlight the integrity of research beyond what is invisible, intangible, searchable and discoverable, even if rarely read, understood or impactful.

Notes

1. For the record, the youngest ever PhD ever was awarded to Johann Heinrich Friedrich Karl Witte, aged 13. See https://www.guinnessworldrecords.de.

2. http://ecahe.eu/w/index.php/Framework_for_Qualifications_of_the_European_Higher_Education_Area#Third_cycle_-_PhD.

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Bio

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