Architectural design research in small practices

Abstract

Purpose – There has been a recently growing interest by architects in practice-based research and the impact of research. At the same time, several post-graduate architecture programmes with practice-led research agendas were founded. This shift towards architectural design research, is analysed using the notions of 'process-driven research', 'output-driven research' and 'impact'. The study aims to investigate and unveil the link between graduate programmes and graduates with a research interest and to test the tripartite model of 'process-driven research', 'output-driven research' and 'impact' in the context of small architectural practices.

Design/methodology/approach – The study uses a qualitative and exploratory research approach that includes 11 in-depth interviews conducted in 2020, during the first nationwide COVID-19 lockdown in the UK. Selected interviews were architects representing (1) members or alumni of practice-related graduate architecture programmes in London and (2) founders of London-based small architectural practices within the last decade.

Findings – While focusing on the London context, the paper offers transferable insights for the key potentials of practice-led design research in small architectural practices and the actions that might improve research practice.

Originality/value – This paper addresses a lack of studies on how design research differs between diverse types and sizes of architectural firms, why emerging small architectural practices increasingly engage with research and how this shapes their practice. This knowledge is important to fully understanding architectural design research and its strengths or weaknesses.

Keywords Architectural design research, Architectural practice, Architectural education

Paper type Research paper

1. Introduction

Research in architecture is traditionally rooted in academia but has recently gained greater prominence in practice. The value of research to architectural practice (Fraser, 2013; Geiser, 2008; Hensel and Nilsson, 2019; Joost *et al.*, 2016; REF, 2014; RIBA, 2014; Till, 2005) and the importance of design to the economy (Design Council, 2018) are widely recognised, with practice-based research promoted by the government (BIS, 2013) and professional institutions in the UK construction industry (RIBA, 2017). While predominant in large offices (Groat and Wang, 2013), growing support has fostered more research activities in small architectural offices. This is especially the case where these offices are engaged with academia through teaching or are directed by recent graduates from postgraduate programmes with strong practice-led research agendas.

Whereas previous studies discussed research in large architectural offices (Aydemir and Jacoby, 2022), this paper's focus are the new forms of practice emerging in small offices that prioritise exploration and experimentation. This study is specifically interested in how practice-led research in academia and industry might become less distinguishable when an architect is both a research practitioner and practising researcher, as well as how the positioning of some small architectural offices relates to the experience of a taught academic research programme or how academic research programmes might be informed by innovative practice. These questions are explored through a focused study of new graduate architecture programmes in London and interviews with young practitioners from London-based offices with an explicit research agenda. London was chosen as a case study due to its unique density and diversity of schools of architecture, architectural offices, and professional organisations, which has created strong connections and rich exchange between academia and practices.

The understanding of architectural practice has evolved from 'complex interactions among interested parties, from which the documents for a future building emerge' (Cuff,

1992) to definitions that include 'different set of roles and new types of outputs that relate to a very different set of values' (Bryant *et. al*, 2019). In other words, the architecture profession is no longer solely focused on a building and its requisites. Instead, it increasingly engages with wider cyclical and iterative research processes that involve new types of collaborations whose objectives are not necessarily immediate outputs but long-term design innovation with commercial or social values. This shift towards architectural design research is part of a rethinking and exploration of what architectural notions of 'process-driven research', 'output-driven research' and 'impact' can mean (Aydemir and Jacoby, 2022). This tripartite structure builds conceptually on previous general design research models that distinguish between research 'into', 'for' and 'through' practice (Frayling, 1993) but also more specific design research definitions in architecture according to 'processes', 'products/outcome' and 'performance/impact' (Till, 2005). In the following, this paper refers to architectural design research as practice-based or practice-led research focused on architectural design practice and design thinking (Fraser, 2013; Luck, 2019). While design research is widely discussed in all design-related disciplines, this paper's focus is the discourse in architecture (Collins, 2014; Fraser, 2013; Hill, 2013; Luck, 2019; Rendell, 2004; Rust, Mottram and Till, 2007; Till, 2005; Van Schaik, 2019).

Design research has become relatively common in large architectural firms since the 2000s and led to the rise of dedicated research departments or groups that typically engage with conventional, process-driven research (Aydemir and Jacoby, 2022). In comparison, as small practices lack the financial and human resources, they tend to work in less conventional office settings, undertake more collaborative research and depend on external funding and support or conduct self-initiated research in their own time. The focus is often less commercial research, especially when the work of some small practices is still more speculative than applied. There is also an evident sharing of research agendas among many

young practitioners and the postgraduate programmes they have graduated from or in which they teach.

A previous study defined architectural design research as consisting of 'cyclical and iterative processes of research in which the means of architectural practice, often in collaboration between practitioners and stakeholders, produce design innovation and thinking with tangible impact and commercial, cultural, or social values' (Aydemir and Jacoby, 2022). While design research in larger architectural practices is more established and tends to be more visible, design innovation and research equally occurs in smaller practices. To understand the full range of architectural design research practices or recent practice-led and practice-based methodological advances in architecture, one has to therefore also take account how the type and size of an office might result in different research processes, outputs and impact.

With the Bologna Declaration acknowledging research in design disciplines in 1999, pedagogy and curriculum have become important to bridge how researchers practise design and how practitioners research design (Craig and Ozga-Lawn, 2015), with research in practice having become an accepted form of research (Joost *et al.,* 2016). As design is considered a discipline in its own right (Cross, 1982) and architecture as having a distinct disciplinary knowledge (Till, 2005), similarly design research in architectural practice is now recognised as a form of knowledge production. Challenges arising from a translation of research criteria between academia and practice has thereby led to several formative studies on the meaning and type of design research, both generally and specifically in architecture (Frayling, 1993; Archer, 1995; Cross, 1999; Rendell, 2004; Till, 2005; Jenkins *et al.* 2005; Geiser, 2008; Fraser, 2013; Hensel and Nilsson, 2019).

Among the research 'into', 'for' and 'through' practice, the latter, which is commonly referred to as practice-based research, is most distinct from traditional academic research

definitions. Architectural practice-based design research foregrounds a practice- or design-related problem, whereas traditional academic research in architecture tends to use design analysis to support theory building. But more generally, architectural design research can be both process-driven or output-driven, and often has a public audience and benefit and, hence, a more legible research impact strategy. With academic programmes increasingly dedicated to promoting the public and social impact of architecture, they consequently have also become interested in more rigorous processes and outputs of practice-led research that can create a research impact.

Architectural education and practice are said to be in a constant state of crisis (Hyde, 2012; Harriss and Froud, 2015), reflecting wider systemic environmental, political and social challenges. In response, for example, issues of adaptation, experimentation and critique have become the focus of some postgraduate programmes while simultaneously embracing practice-led design research methods and aims to tackle the gap between learning and practice. The Architectural Association School of Architecture's Design + Make, the Goldsmiths College's Centre for Research Architecture and the London School of Architecture (LSA) are examples of the range of institutions and programmes that have taken this approach. Their pedagogical research agendas have successfully incubated disparate practices that emphasise new design research processes, outputs and impacts.

Small architecture offices led by recent graduates or academic teaching staff can differ noticeably from large firms in the way they collaborate and engage with the public and funding, and are more connected to agendas formed in academia (Table I). The diverse and distinctive research approaches found in small architectural practices provide a valuable context to further draw out different understandings of practice-led research.

There is, however, a significant lack of data and debate on research in small architectural practices, which this paper addresses through selected in-depth interviews with

members of graduate architecture programmes and emerging small architectural practices founded in London within the last decade. The interviews and their analysis aim (1) to investigate and unveil the link between graduate programmes and graduates with a research interest and (2) to test the tripartite model of 'process-driven research', 'output-driven research' and 'impact' in the context of small architectural practices. In the following, first, the research methodology of this paper is explained and then how small practices engage with architectural design research is discussed using a tripartite analytical framework.

2. Research Design

The study adopts a qualitative and exploratory research approach that includes 11 in-depth interviews conducted between May and July 2020 during the first nationwide COVID-19 lockdown in the UK. Interviewees were architects representing (1) members or alumni of practice-led new graduate architecture programmes in London and (2) founders of London-based small architectural practices (Table I). The interview data was complemented by a documentary analysis, including that of online and print publications. Prior to the interviews, projects published on social media, office websites or print media were reviewed and informed the interview questions.

The selection criteria for the first group (1) was being a faculty member or student of pre-selected graduate programmes; and for the second group (2), it was having founded a practice after 2010 in London, being recognised as an emerging architectural practice and being currently involved in teaching. The offices were selected from *New Architects 4*, a listing of best British practices established in the past ten years, published by the Architecture Foundation (AF) in 2020. Although there are other relevant graduate programmes and emerging practices across the UK, the vast majority of offices included in *New Architects 4* are London-based. In addition, as many of the architectural practices and graduate

programmes in London are linked by close professional networks and exchange of people and knowledge, London was considered a good case study for how practices and academic institutions share research agendas.

First, in-depth interviews took place with tutors, students or founders of selected postgraduate programmes in order to understand their potential influence on new practices. Among the interviewees, Shengning Zang (AA, Design+Make), Sergio Beltran Gracia (Goldsmiths, Centre for Research Architecture) and Studio 8FOLD (the London School of Architecture) represented alumni of these programmes and James Soane is a faculty member of the LSA. This was followed by eight in-depth interviews with small architectural practices, including two collectives, to discuss how they engage with design research. The interviews with Re(s)public Collective, Resolve Collective, Studio 8FOLD and Projects Office included all co-founders, while Nimi Attanayeke, Matthew Butcher, Jonathan Hagos and Thomas Randall-Page were interviewed individually.

Interviews were semi-structured and based on preceding conversations with practising architects and academics through which the main themes to be discussed in the interviews were established. They lasted for around 30-40 minutes and were held and recorded online due to the COVID-19 lockdown. The structure of the interviews was communicated to the participants in advance via e-mail. Basic interview questions were about the participants' views on research, the importance of collaborations, access to funding and infrastructure, impact and involvement in academia, in order to understand the research processes, immediate or long-term research outputs and research impact of small practices. But additional unplanned questions arising during the interviews gave interesting further insights. For example, links between taught approaches and practice experience were discussed.

The interviews were transcribed verbatim and thematically coded and analysed. Although the number of interviews were limited and, being a qualitative study, there was no

intention of generalising findings, the study revealed some important trends and issues in architectural design research.

Graduate Programmes	voices	role/practice	background	place	founding date	recognition/ awards
1	Shengning Zhang	Student, Studio Snng	AA Design+Make	New York	2010	
2	Sergio Beltran Gracia	Student	Goldsmiths Centre for Research Architecture	London - Mexico		
3	James Soane	Project Orange, faculty member LSA	Cambridge University, UCL The Bartlett	London	2013	RIBA Regional and National Awards
Small Practices	**voices**	**role/practice**	**background**	**place**	**founding date**	**recognition/ awards**
4	Nuria Benitez Kiproula Bartzoka Rime Cherai Moritz Dittrich Jonathan Gayomali	Re(s)public Collective	Royal College of Art (MRes Architecture)		2019	
5	Akil Scafe-Smith Seth Scafe-Smith	Resolve Collective	UCL The Bartlett, LSE Cities	London	2016	New Architects 4
6	Alexander Frehse Alexandar Stojakovic	Studio 8FOLD	London School of Architecture	London - Berlin	2017	New Architects 4
7	Nimi Attanayake	nimtim architects	University of Nottingham, Westminster University	London	2014	New Architects 4, AJ 40 under 40(2021)
8	Megan Charnley James Christian Bethan Kay	Projects Office	Royal College of Art (MA Architecture)	London	2015	New Architects 4
9	Matthew Butcher	Matthew Butcher	UCL The Bartlett	London		New Architects 4
10	Jonathan Hagos	Freehaus	UCL The Bartlett	London	2012	New Architects 4, AJ 40 under 40(2021)
11	Thomas Randall-Page	Thomas Randall-Page	London Metropolitan University	London	2014	New Architects 4

Table I: Taxonomy.

3. Process-driven research in small practices

Process-driven research in architectural practice has a planned and cyclical research design and process, and can be characterised as being well-documented, fully integrated with practice activities and usually part of collaboration with industry and academia (Aydemir and Jacoby, 2022). Process-driven research activities in practice are closer to those in conventional research and therefore more easily recognised as research, with their outcomes producing transferable knowledge and insights. In large practices, this type of research often focuses on materials, design innovation, and design prototypes, using both participatory

design and quantitative methods. In comparison, in the small practices studied, process-driven research tends to engage more with problems of interdisciplinarity and collaboration, often in the context of civic projects while using participatory design processes such as workshops and qualitative research.

> As a young practice, we relied quite heavily on collaborations and collaborative opportunities as a way of widening our reach, improving ourselves and our experiences. Especially through our teaching roles, we began to collaborate with a cross disciplinary spread of different practitioners. ***- Jonathan Hagos, Freehaus***

As the interviews show, collaborations can form both the organisational structure of a practice (e.g. Resolve Collective, Re(s)public Collective) or can be project-based, working with specific institutions, firms and professionals. As an example, The Marble Pavilion (2016) was a collaborative design-build experiment between Freehaus, Cultural Geometries, Empresa Transformadora de Mármores do Alentejo (ETMA), Solubema, Oxford Brookes University and the University of Brighton (Figure 1).

Figure 1. The Marble Pavilion - Freehaus, 2016. © Photography: Cultural Geometries Group

The pavilion is a un-reinforced marble structure built from marble waste, which was developed through a series of design workshops and 1:1 testing, and later turned into an educational tool in the quarry and factory for site visits by architecture schools (Howe, 2016). The development of the Marble Pavilion included material experimentation motivated by

environmental concerns for excessive waste production by construction activities. It built on interdisciplinary collaborations between academy, practice and industry partners both locally and internationally and led to public engagement activities and innovative design outputs. It is therefore a good example of the purposeful design innovation resulting from process-driven research.

Social values play an important role in how the studied small practices work and conduct process-driven research. Participatory design and collaboration are seen as critical to their interest in research that directly involves end-users, future beneficiaries and inhabitants in decision making processes. For example, focused on how architecture can facilitate better community building and dialogue, Freehaus developed a series of civic projects such as St Michael's Community Centre, The Clement James Centre, Rising Green, Whitchurch Fields, and Rokesly Junior School. In 2019, Freehaus was also selected through an open competition to lead the transformation of a former office building known as Gunpowder House into The Africa Centre, a London-based charity (Figure 2).

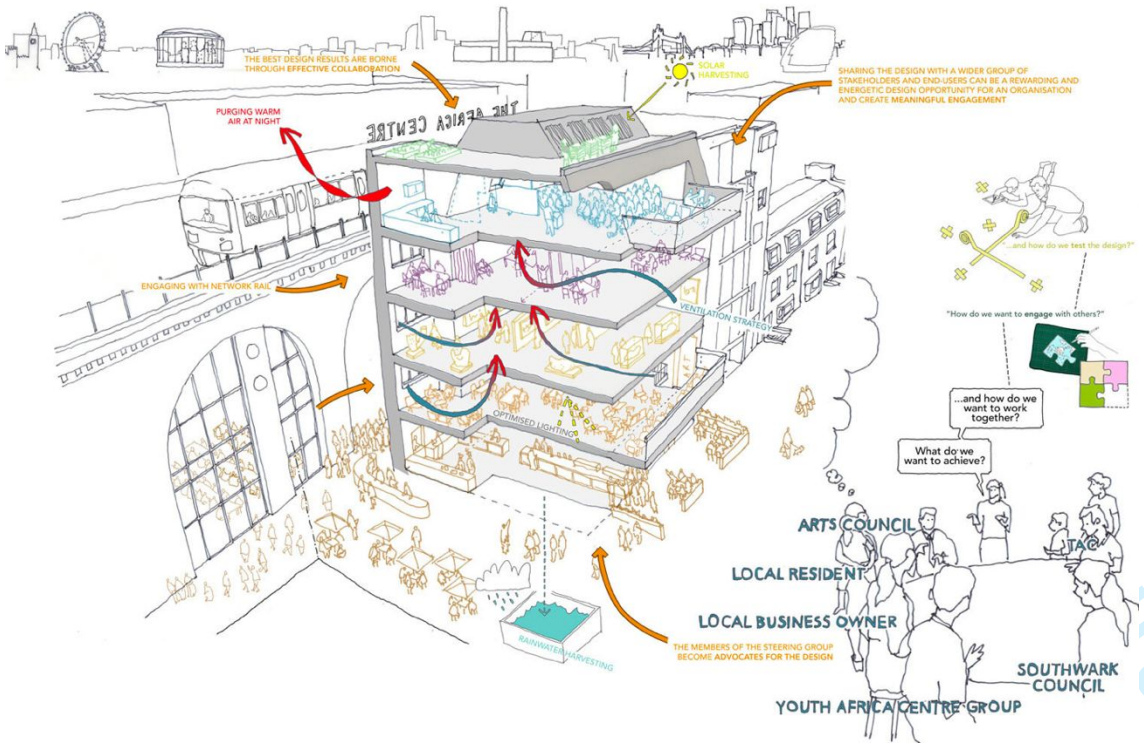

Figure 2. The Africa Centre, 2022 © *Freehaus*

This retrofit project was backed by the Mayor of London's Good Growth Fund and participatory research involved local residents and business owners, the Youth Africa Centre Group, the Arts Council and Southwark Council. An integral part of Freehaus' collaborative practice includes a process-driven and research-based engagement with different members of the community and the broader construction industry, which ultimately allowed them to create a planned research process, robust documentation and tangible research outputs.

Process-driven research can be found in architecture schools as well. For instance, emerging from a collaborative initiative first launched by Alternative Routes for Architecture (ARFA), the London School of Architecture (LSA) was founded to create new links between academia and practice, architecture and other disciplines and the school and the city. The school questions the mainstream university system's ability to nurture the architects of tomorrow, as it lacks sufficient connections with the profession and is unaffordable to many (Kinneir, 2019). James Soane, who runs the Critical Practice module at the LSA, claims that architectural education must become much more societal, political and activist to address the fundamental crisis of modernism facing the profession. Promoting a practice-led design research approach, the LSA thus tackles contemporary challenges by teaching new ways of thinking and recalibrating how we live in and build our environments.

> We need to learn a whole new way of thinking and that's where I suppose the research comes in. What we can learn from this person, this architect, this city, this charity… ***- James Soane, London School of Architecture***

Central to the pedagogy and philosophy promoted by the LSA in its response to perceived key challenges of our time is critical thought, engaging in collaboration, manifesting a personal agenda and being both inside academia and practice. According to Soane, critical thought demands positive action and a creative response. Group work is hereby key to encouraging architecture as a collaborative process, and a reframing of history

and theory is needed to develop personal agendas, while having a network of practices helps students to understand how real practices operate.

To summarise, process-driven architectural design research has a planned research and design process. When comparing small to larger practices, there seems to be a greater dependence on interdisciplinarity and collaboration between industry and academia. In projects that are more civic in nature, they tend to focus on participatory processes and material experimentation that prioritise environmental, social and educational concerns and values. Although the impact and immediate value of process-driven design research in small architectural practices can be less certain, it offers to them an important form of recognition through collaborations and enables them to become professionally competitive.

4. Output-driven research in small practices

Output-driven research in architecture is usually evidence based, has an iterative research process and feeds directly into the creative process of design. Usually undertaken in collaboration with industry partners, output-driven architectural design research produces tangible and singular outcomes through a process of design innovation. In large practices, this generally relates to the immediate design of building elements and material components (Aydemir and Jacoby, 2022). Likewise, output-driven research in design-led small offices is also predominantly project-specific and motivated by direct implementation, and a common approach when developing non-standardised design solutions.

Project-based collaborations that bring together diverse expertise in output-driven research is fundamental to how architectural practices work. But this can only be considered as research when design outcomes are reproducible in different contexts and provide more than a singular design solution. Particularly, small practices benefit from collaborations when delivering complex projects, due to often limited resources and therefore expertise. Air Draft (2018), a collaboration between Benedetta Rogers and Thomas Randall-Page, is an example

of a material-based, project-specific and output-driven architectural design research process (Figure 3). The project won the 2018 Antepavilion, a competition held by an arts and architecture charity in 2017. Air Draft was designed as a two-level inflatable space on a barge, which can deflate quickly to pass under bridges along London's waterways. The Air Draft project benefitted from the help of structural engineers AKT II (Antepavilion, 2018) and the expertise of Cameron Balloons in the design of the inflatable structure.

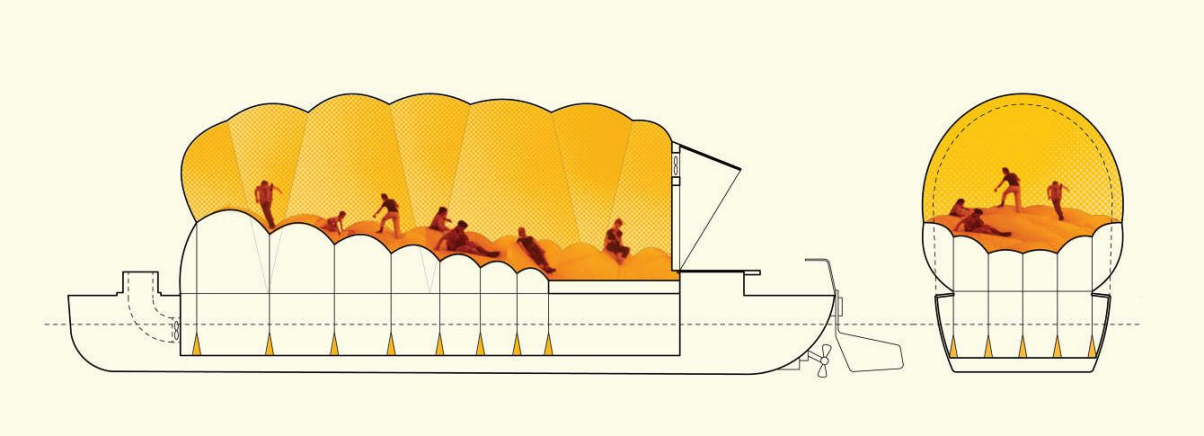

Figure 3. Air Draft, 2018 © Thomas Randall-Page

Output-driven architectural design research, despite often being part of project-based collaborations, can lead to iterative and cyclical processes that extend beyond the initial outcome to successive projects. For example, Projects Office collaborated with the artist The Vacuum Cleaner on the Madlove: A Designer Asylum project, which helped them win the competition for the Child and Adolescent Mental Health Service (CAMHS) project in Edinburgh (Figure 4). They developed through this collaboration an expertise in mental health service use, while another collaboration with an arts project management organisation gave them insights into a multi-staged and iterative process of project delivery, with both building up the skills needed for the competition. This shows how output-driven research in small practices can directly feed creative processes and inform future work.

> The CAMHS project was probably the best example that we had time to do brief development… We were certainly able to, because it was quite a structured process. We worked with an arts project management organisation who have a lot of experience of projects of that type and they have a phased process that's not dissimilar to RIBA stages. But

that did allow us to present the project to staff, receive feedback, refine it and represent it again over a longer period of time. ***- Projects Office***

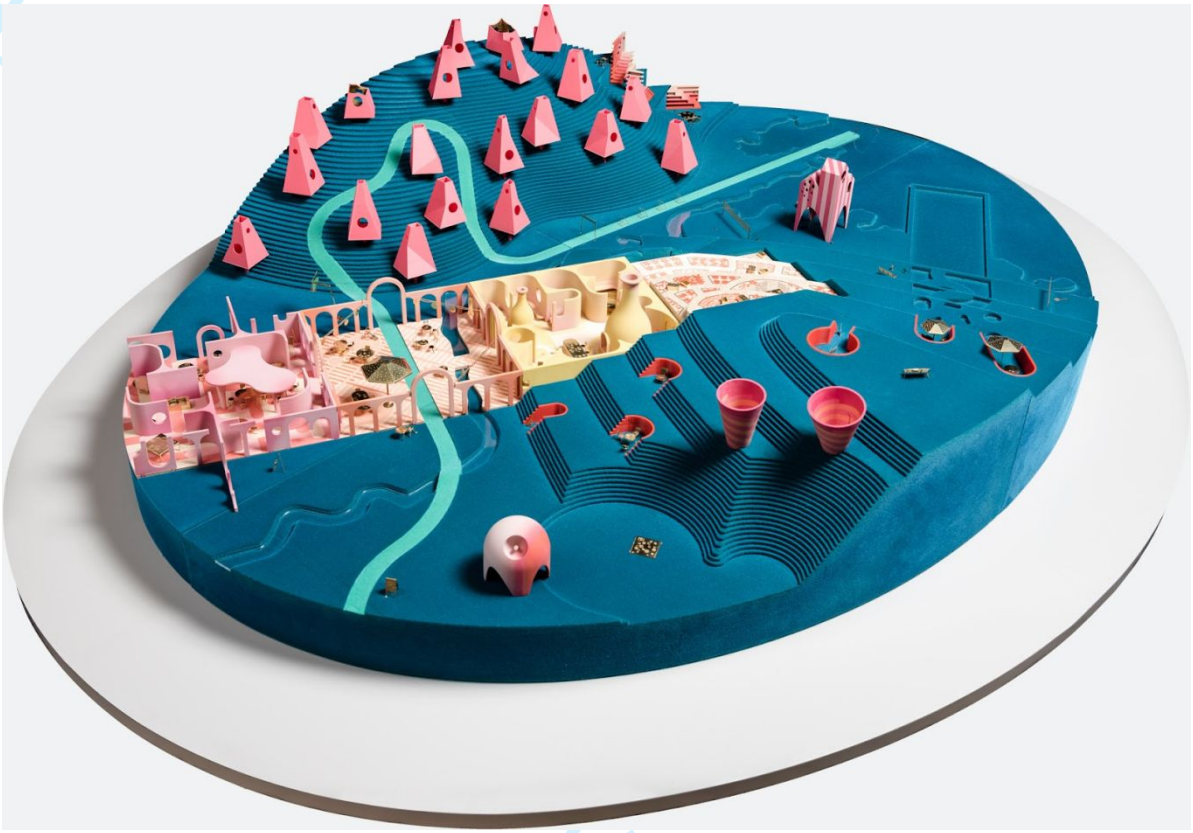

Figure 4. Madlandscape for Madlove Project, 2016 © Projects Office

A well-known example for output-driven research in education is the Architectural Association's 16-month graduate programme Design + Make, which is known for research through 1:1 prototyping at component and building scale. According to Shengning Zhang from the 2018 cohort, the focus of the programme is on the use and structural exploration of sustainable materials. Working with external collaborators, the programme investigates the materialisation of architecture through the synthesis of advanced technologies, craft techniques and natural materials. Full-scale building projects and full-scale system prototypes are used methodically in the design research through which students develop important management, coordination, service-client relationships, manufacturing and technical skills. An important means of knowledge building is the integration of advanced technology into the making processes such as CNC, robotics, 3D scanning and photogrammetry. Competence

gained through this in design and management skills can significantly inform the practice of graduates.

> While I want to maintain my workshop doing furniture building, I am also pursuing a more design-build and construction management direction as well, and reaching out to larger practices that professionally do those things in New York. Because the programme had made me realise that at the end of the day, coordination, collaboration, scheduling, and the delivery of the project were the things that I found the most interesting. **- *Shengning Zhang, AA Design + Make graduate***

To summarise, output-driven design research in small architectural practices often has an iterative and planned process that produces tangible and singular outcomes; however, it tends to result in non-standardised solutions that can also inform future projects. In other words, output-driven research can be cyclical, therefore, sometimes overlaps with process-driven research approaches. Furthermore, this research is usually project-specific and based on material experimentation, forming a direct part of creative and collaborative design processes. For this reason, output-driven research is more practical and common in small practices than process-driven research, which requires greater resources. Generally, its weaknesses include that distinguishing output-driven research from everyday practice can be difficult and that clients are reluctant to fund design experimentation and research.

5. Impact

Although small practices cannot afford to maintain their own research departments, they are increasingly engaged in research too and tend to be more agile and experimental, undertaking more fundamental research that might question what general social and cultural values architecture has to offer. Specifically, the interviews revealed that small practices are interested in both immediate and long-term impacts related to a wide range of challenges. These impacts are related to a range of issues from social problems to the politics of recycled materials, appropriation of found objects, intergenerational living, waste management and reuse, mental health, material resources, social welfare, community building and dialogue, to experimental design and design-build approaches. These can be more generally grouped into

studies of the built environment, material history or politics, sustainable urbanism and public engagement.

Both the Research Excellence Framework (REF) in the UK and the Royal Institute of British Architects (RIBA) introduced and emphasised impact criteria for research in academy and practice. The REF's definition of impact is 'an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia', which is consistent with the impact criteria used by professional bodies and industry-oriented funding organisations for practice-led research (RIBA, 2017; Supplemental Charter of 1851). Research impact is consequently measurable in terms of how architectural design research brings about an effect, change or benefit of public interest. And impact is important to architectural practitioners and the assessment of research, whether in academia or practice.

Publicly-funded research is especially focused on impact (Samuel, 2017; UK Research and Innovation, 2020) and therefore more concerned with the means and methods of dissemination. With architectural design research naturally having public audiences that can include policymakers, stakeholders and users, but also addresses diverse communities of practitioners and academics, its potential to disseminate outcomes and engage effectively with varied target audiences and achieve greater impact is high. For small practices and academic programmes, a focus on impact offers research opportunities that are little discussed.

First, being small, necessitates greater collaboration and diverse partnerships that potentially enhance the range of beneficiaries of a project and its cultural, social or commercial impact. For example, Resolve Collective's practice can be defined according to its collaboration with 'architecture and design firms', 'cultural and public institutions' and 'smaller creative organisations'. They often collaborate with architecture and design firms on

public work commissioned by a local authority based on their expertise in engaging with residents and stakeholders. They similarly have completed art installations commissioned by cultural institutions that built on their ability to integrate public participation into their work and research.

> When we are working with architects and designers, we tend to do a lot residents-stakeholder engagement side of things. Whereas when we work with galleries, there's always a need for participation and outward looking focus, but we tend to have a bit more creative freedom on what gets created and built because of the nature of the projects. Lastly, we try to do this more but we work with a lot of smaller creative practices like ourselves. ***- Resolve Collective***

Second, part of creating impact is dissemination, such as collaborations with curators and artists and galleries or museums, guest editorship of architectural journals or participation in public design festivals. Working with diverse public audiences can define the work of some smaller practices and offers an important opportunity for them to build their reputation. For instance, Resolve Collective has worked on exhibitions at prestigious institutions such as the Tate, the Royal Academy and the V&A Museum. Matthew Butcher is the founder and editor of *P.E.A.R: Paper for Emerging Architectural Research* and guest-edited the special issue 'Re-Imagining the Avant-Garde' for *Architectural Design* in 2019. His work was exhibited at the V&A Museum, the Storefront for Art and Architecture, the Architecture Foundation, the Prague Quadrennial and Betts Project.

Third, graduate programmes foster greater research collaboration and diversity by welcoming graduates from a wide range of disciplines. For example, the Goldsmiths' Centre for Research Architecture multidisciplinary team, working with students from diverse backgrounds, has developed a new research model using advanced spatial and media-based methods to engage with 'questions of contemporary culture, politics, media, ecology and justice' (Goldsmiths University of London, 2022). Its MA Research Architecture programme, especially the Forensic Architecture (FA) option module, is very closely aligned with the work of the Forensic Architecture Agency, which developed from a European Research

Council research grant led by Eyal Weizman, showing how research and pedagogy can be closely connected.

Beyond architecture, what you can see in related design fields is how public engagement between teaching and practice is becoming stronger with individualised and independent learning models. An extreme response was Make Your Own Masters (MYOM) instigated by Stacie Woolsey in 2019, 'an alternative learning experiment' to the unaffordable postgraduate art and design education in the UK. This programme is inclusive of design-related disciplines such as architecture, jewellery, sound design, film, fine art, graphic design, industrial design and product textiles, trying to create a new model of bridging academia and industry. Conceived as an independent learning system, MYOM guides its learners through a custom-build and industry-sourced programme. While the 18-month programme is largely based on remote learning, the class of 2020, for example, also had access to residencies – space or facilities offered by industry partners like the Design Museum, Makerversity, Somerset House, Blackhorse Workshop, the Koppel Project and Templo.

6. Funding, resources and infrastructure of small practices

As funding bodies have expanded their remit to include practice-led research, more practitioners have embraced this as an opportunity to shape their practice's focus and collaborations. The kind of practice-led, experimental and social or public research that some small practices have become known for, while still not commonly funded, has seen increasing support by public authorities and art funders. Local authorities have become an important promoter, especially of civic projects. However, the funding usually comes from a secondary source, involving a longer and more competitive process of funding. Yet small practices do not always have the skills and experience to find clients and funding.

> Lots of our projects have National Lottery Heritage funding or they have GLA Good Growth funding. In fact, I'd say, pretty much all of the civic projects we're working on have public

> funding from local authorities, which is great, but obviously that's not necessarily us seeking those funds to practice. That funding to practice, it's obviously client side. ***- Freehaus***

> We didn't have any direct involvement with commissions. The organisation works with the Children's Hospital Charity to do the funding application. ***- Projects Office***

Recent financial support for small practices includes the Emergency Response Fund from the Arts Council England, which was created in response to COVID-19 to support creative practices, such as Resolve Collective, and the cultural sector with their overheads and infrastructural costs. Other offices have benefitted from industry-support or research and project grants. For example, Studio 8FOLD received free software licensing from Autodesk through their Technology Impact Program, while Matthew Butcher obtained funding for his projects from the Arts Council and the University College London.

> We applied for the entrepreneurial grant from Autodesk three years worth of licensing, which means that we could model everything in BIM. Revit is too expensive to run for small projects. But what we found, it's fundamental because you have the same problems that you would have with big projects and it just means we can be more efficient and test things more. ***- Studio 8FOLD***

Despite growing opportunities, the practices interviewed reported insufficient research funding that met their specific needs. Thus, often motivated by personal interest, research can be self-initiated and unpaid. Yet the ability to undertake design research in small practices and finding suitable funding is seen by many as essential for their growth and development.

> We are interested in trying to find clients that can support us to do more design development work. Lots of young practices, I assume, want to have clients that will actually, really engage with prototyping and design development. But actually, clients just want to pay for the end result and to get it right the first time. Most of the research or design development is done unpaid, so we can't do as much as we like. ***- Projects Office***

> It is extremely unusual to have a project where you're given that kind of freedom. And that kind of faith was placed in you to produce something in a really experimental way, and there is not much faith based in young practices in the UK. They will always default to the safe option of an established practice. There's very little opportunity, I think it's very highly competitive. ***- Thomas Randall-Page***

New, unconventional work practices are emerging, with some renting out individual desk spaces, sharing digital infrastructure such as BIM applications or relying on resources like workshops provided by universities. But collaborations between small offices and a

sharing of infrastructure and resources are not only motivated by economic pressure. Importantly, it is seen as an opportunity for knowledge exchange and developing professional relations. These shared spaces are also different from typical coworking spaces, as the practices that form sharing communities are mostly from architecture with similar infrastructural needs and views on practice, which can create unintended disciplinary silos. Aided by digital infrastructure, having multiple office locations have become possible, giving smaller practices much greater flexibility where and how to operate.

> We have our own studio in a multi studio building… There weren't as many opportunities to collaborate as I would have liked, because when you have multiple small practices working together, sometimes there's a tendency to be myopic and focus on your own output. But I would like to think that if we're going to do that again, potentially have someone outside the architecture industry that we might better collaborate with. ***- Freehaus***

Small practices show innovativeness when finding and accessing the resources needed to practice, whether through a university or commercial workspace. Especially universities giving access to workshops and research support to staff have become an important resource to the small practices interviewed.

> I have an office at home and a basement with tools which I'm not using all the time. I don't use co-working or co-making spaces, but I do have access to university workshops both at the Oxford Brooks and the AA. Just when I need a little bit of laser-cutting or something I don't have in my basement, like welding... ***- Thomas Randall-Page***

Collaborating with peers is not only seen as an important form of solidarity but also the means of building a community of like-minded researchers and practitioners to explore the limits of architecture. This was, in particular, experienced as an essential lifeline during the COVID-19 pandemic when practices had to adapt to new, online work conditions and processes. Resolve Collective, for instance, used Slack to communicate and develop an online art project that captures feelings, thoughts and memories during the COVID-19 pandemic.

7. Conclusion

Architectural research is not only associated with academia but, through design research, also with practice. Especially practice-led research, as the work by the studied small architectural offices demonstrates, can challenge previously well-defined boundaries between research and practice, education and practice and process and product. New (research) practices are hereby noticeably linked to symbiotic relationships between practice-led research in architectural graduate programmes and their teaching staff or graduates.

Some of the main characteristics and opportunities of architectural design research, such as experimentation, public engagement and impact, are particularly evident in the work of small practices with close links to academic programmes and research. Reasons for this could be that smaller practices tend to be more flexible in their structure and therefore might engage in greater experimentation but also that the practice-led research in the postgraduate programmes studied promotes social values and environmental agendas. However, even though many of the interviewed practitioners were involved in academia, they often did not see this connection clearly themselves. While this study is limited to a number of small and research-intensive architectural practices in London, the observations and insight are potentially transferable to other contexts. A future study of a more representative cross-section of British education and practice would address some of the current limitations of the study.

To conclude, the key potentials of practice-led design research in small architectural practices and the actions that might improve research processes and outcomes can be summarised as follows:

- Design research is often not as fully planned as in larger practices but similarly tends to be iterative and cyclical both in process- and output-driven research while foregrounding design experimentation, design innovation and social values.

- Actions to enhance this potential might include better planning the design research process to move between iterative stages while identifying and managing the research outcomes that might inform future projects.

- Due to limited available resources but also out of choice, small practices extensively engage in collaborative research activities and partnerships, gaining expertise in social practices such as co-design, participatory processes and public engagement.

- Actions to improve this research expertise includes promoting and facilitating the diversity of collaborations and partnerships and developing ethical participation and engagement protocols.

- Practice-led design research can have both an immediate impact, specifically through project-related and output-driven research, and longer term impact through process-driven research.

- To maximise the impact, pathways to impact should be planned early on and developed throughout a project duration with collaborators.

- Architectural design research in small practices with links to academia has a particularly strong focus on the agency of architecture and the impact of ethical, social, economic, or environmental issues.

- Actions to enhance the social value of research practice and impact may include prioritising, encouraging and integrating this type of research by providing more funding support and greater focus on long-term social impact.

While architectural design research can be generally defined as 'cyclical and iterative processes of research in which the means of architectural practice, often in collaboration

between practitioners and stakeholders, produce design innovation and thinking with tangible impact and commercial, cultural, or social values' (Aydemir and Jacoby, 2022), design research in the small practices studied, especially reveal the potential of architecture as a social practice that can create social values. Actions that might improve research practice in small practices can contribute to the implementation of new public policies and have great potential to benefit wider communities.

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Graduate Programmes	**voices**	**role/practice**	**background**	**place**	**founding date**	**recognition/ awards**
1	Shengning Zhang	Student, Studio Snng	AA Design+Make	New York	2010	
2	Sergio Beltran Gracia	Student	Goldsmiths Centre for Research Architecture	London - Mexico		
3	James Soane	Project Orange, faculty member LSA	Cambridge University, UCL The Bartlett	London	2013	RIBA Regional and National Awards
Small Practices	**voices**	**role/practice**	**background**	**place**	**founding date**	**recognition/ awards**
4	Nuria Benitez Kiproula Bartzoka Rime Cherai Moritz Dittrich Jonathan Gayomali	Re(s)public Collective	Royal College of Art (MRes Architecture)		2019	
5	Akil Scafe-Smith Seth Scafe-Smith	Resolve Collective	UCL The Bartlett, LSE Cities	London	2016	New Architects 4
6	Alexander Frehse Alexandar Stojakovic	Studio 8FOLD	London School of Architecture	London - Berlin	2017	New Architects 4
7	Nimi Attanayake	nimtim architects	University of Nottingham, Westminster University	London	2014	New Architects 4, AJ 40 under 40(2021)
8	Megan Charnley James Christian Bethan Kay	Projects Office	Royal College of Art (MA Architecture)	London	2015	New Architects 4
9	Matthew Butcher	Matthew Butcher	UCL The Bartlett	London		New Architects 4
10	Jonathan Hagos	Freehaus	UCL The Bartlett	London	2012	New Architects 4, AJ 40 under 40(2021)
11	Thomas Randall-Page	Thomas Randall-Page	London Metropolitan University	London	2014	New Architects 4

Table I: Taxonomy.

Figure 1: The Marble Pavilion - Freehaus, 2016. © Photography: Cultural Geometries Group

264x176mm (72 x 72 DPI)

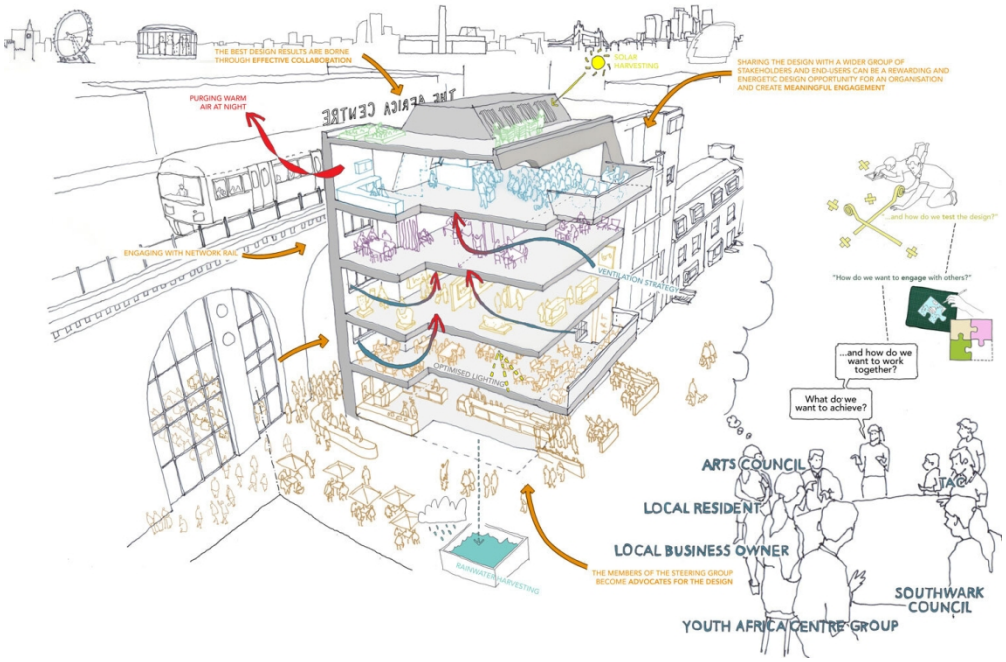

Figure 2: The Africa Centre, 2022 © Freehaus

529x374mm (72 x 72 DPI)

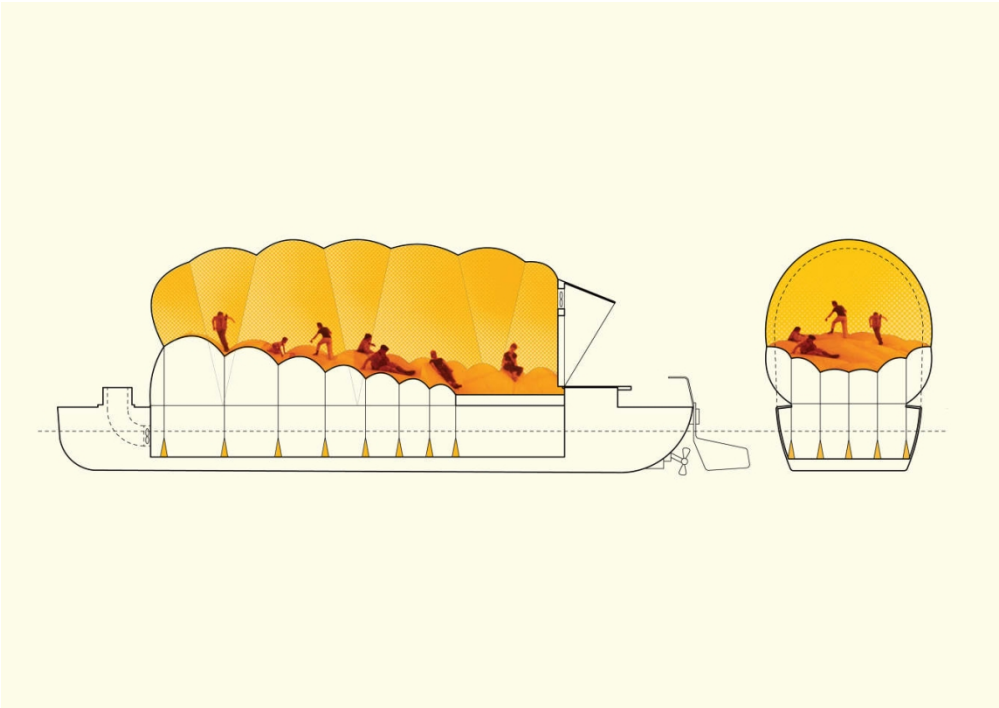

Figure 3: Air Draft, 2018 © Thomas Randall-Page

113x80mm (300 x 300 DPI)

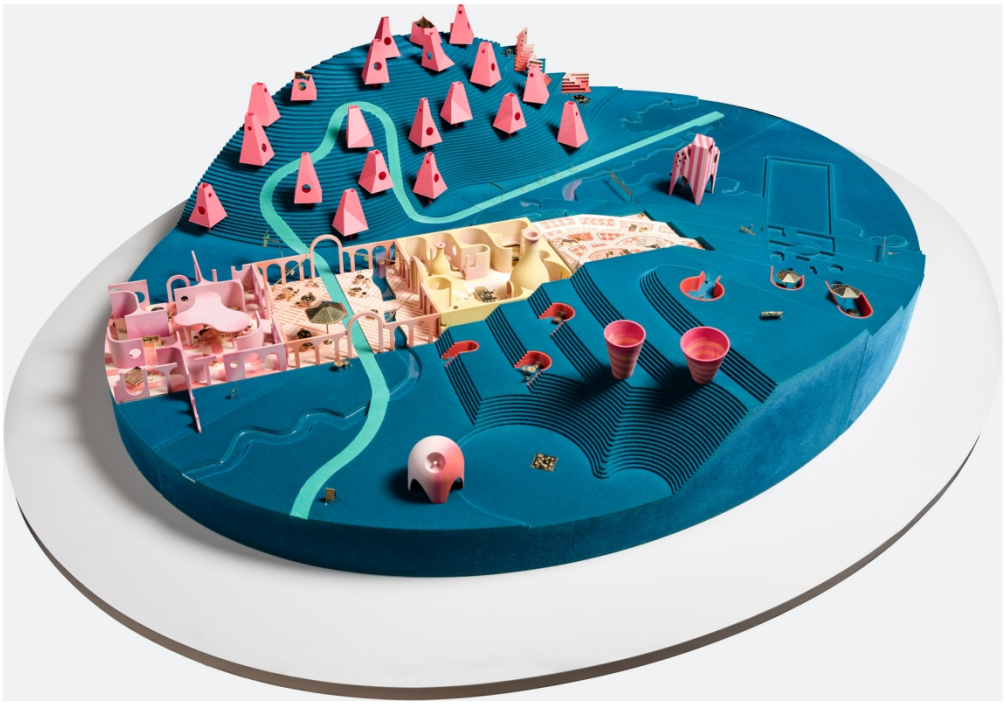

Figure 4: Madlandscape for Madlove Project, 2016 © Projects Office

677x470mm (72 x 72 DPI)