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Take the red pill: a journey into the rabbit hole of teaching informed research.

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ABSTRACT In this article studio teaching is explored as a generator of research. The term *research informed teaching* implies that research precedes teaching, and therefore the traditional term is subverted in favour of *teaching informed research*. Central to the approach are studio projects; they are the essential substance – the data, and become the focus of critical analysis. Reference is made to projects run by the author that were adopted into teaching informed research; the discussion identifies principles to consider – and lessons learnt – when designing such research projects. The morality of students contributing to academics’ research, and their views on being involved, are also discussed. This article demonstrates that the journey into an unknown rabbit warren of unanticipated twists and turns – an inherent characteristic of this alignment between teaching and research – can result in rich outcomes, and argues it is an approach highly suited to the creative environment of the design studio.

KEYWORDS research informed teaching, studio design projects, studio pedagogy, research and teaching nexus

Much has been written about the relationship – the nexus, as it is also called – between teaching and research in higher education.¹ There are conflicting views whether it has a positive, neutral or detrimental impact on the quality of students’ learning experience, resulting in a complex and oftentimes uneasy dialogue between them. This is frequently expressed as a tension between where academics’ priorities should lie. For example, there is evidence to suggest that national

research audits can isolate research from teaching,² at both institutional and individual levels.³ It has also been argued that there is no simple functional relationship between quality of research and quality of teaching at an institutional and departmental level, where teaching and research are often organised separately with limited thought given to how they might be linked.⁴

What ways are there to unite teaching and research in Architecture programmes? A popular perception of the research-teaching nexus is that teaching benefits through the curriculum being informed by research – even if it is conducted independently – thus ensuring that content is at the forefront of knowledge. Whilst that position is not necessarily being questioned here, Griffiths argues that research and teaching can relate to one another in a variety of ways – often influenced by the discipline context and field of inquiry – and the above scenario covers but one.⁵

Architecture programmes – and indeed other creative disciplines – have been far from exemplary at exploring relationships between research and teaching, and identifying ways in which they can create a mutually symbiotic dialogue. This is both ironic and a tragic loss. Original thinking and innovation are fundamental parts of studio design processes, but opportunities are being missed to capture these and formalise them as research outputs. Furthermore, publications about work produced in studios often focus on the projects themselves, as opposed to deeper meanings signified by the work in wider contexts. This article evaluates two case studies – one undergraduate and one postgraduate – that demonstrate potential ways to integrate design studio teaching into research projects as a central part of the methodology, leading to publishable outputs beyond the field of architectural education.

Defining Teaching Informed Research

Griffiths has identified four models of research-teaching dialogue: research-led, research-orientated, research-informed and research-based; this article focuses on the latter, which is defined as being, ‘designed around inquiry-based activities, rather than on the acquisition of subject content’ and where, ‘the scope for two-way interactions between research and teaching is deliberately exploited.’⁶ The argument being put forward here is that this approach is the one most aligned with the creative and divergent processes of the design studio.

Arguably the conventional term *research informed teaching* implies that research comes before teaching, so as to inform content and ensure the curriculum is progressive. However, in the methods described below it is studio teaching and the design processes associated with it that lead the research, and which dictate the paths that it follows. Therefore, the approach has been made distinct by subverting the traditional term in favour of *teaching informed research* (TIR).

Central to TIR are studio projects. Every year in every programme a wealth of creative and inspiring work is produced. Often these projects challenge and explore contemporary problems and issues, and propose a diverse range of innovative solutions. However – more often than not – after the End of Year Show these projects are catalogued and archived, and collectively become nothing more.

In TIR these design projects provide material for research. Whilst the students will conduct their own investigations as an integral part of their conceptual thinking and design development this is independent of the TIR processes, which follow the projects’ completion. They provide the medium for analysis and evaluation against wider concepts and issues, and it is here that the main TIR processes lie. Put another way, the students’ projects are the research data. The following two case studies describe experiences of the approach, after which discussion focuses on the outcomes and lessons learnt about adopting this method of uniting teaching with research.

Case Study One: The Book Repository Project

In November 2013 a project was devised for NQF Level Six Architecture students to design a Book Repository. The brief was for the final project of an undergraduate course at a United Kingdom university – a 20-week design module. It was one of five different projects offered to the cohort, and students were asked to choose which project they wished to work on, subject to an appropriate balance of numbers within each tutorial group.

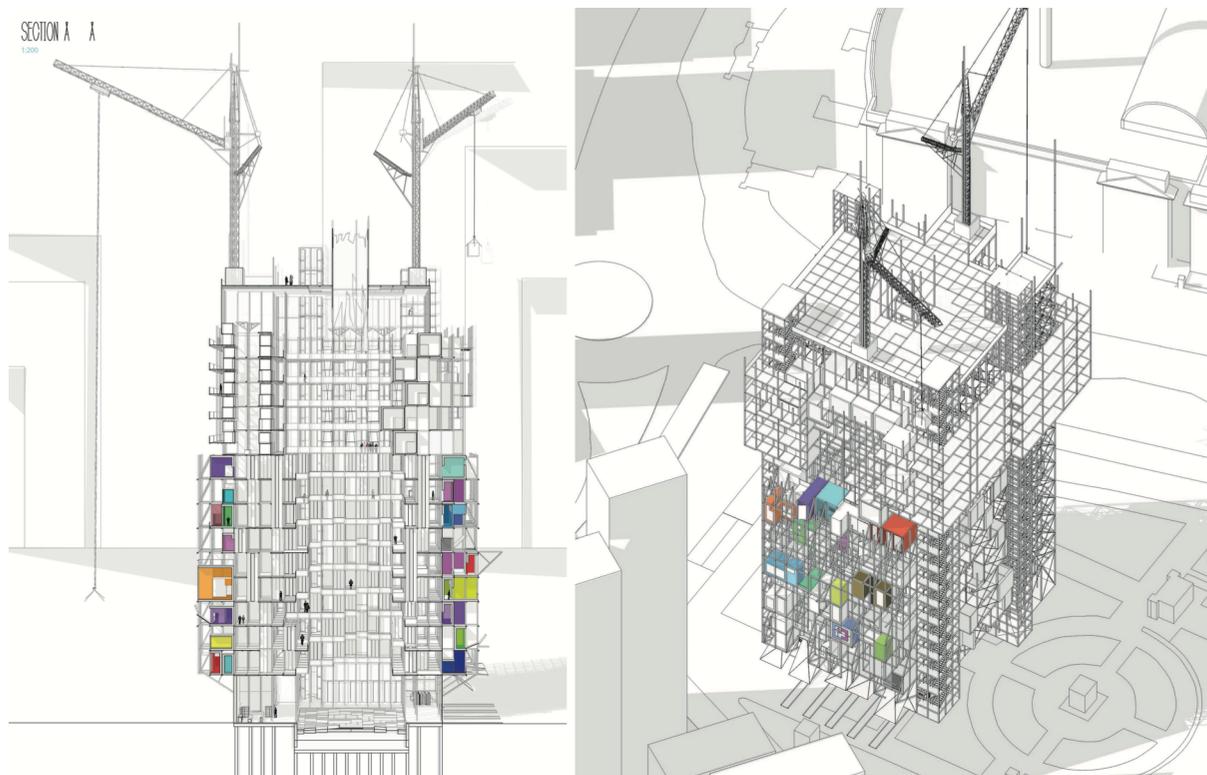


Figure 1: *Library of Iconoclasm* (Sarah Aziz).

An aim of the project was for creative designers who have grown up on this side of the digital revolution to explore the role of books, and of the buildings in which they are housed. The term library was deliberately avoided to encourage students to approach the project without prejudice to a particular tradition or typology. They were asked to consider: the nature of the book as an individual object, the book as a collection, the relationship between the reader and their book, and the nature of research. A site was suggested, although a number of students identified their own site during the course of the design process.

Following their completion, it was clear that a number of the projects addressed a variety of issues facing contemporary library design and the role of library buildings in society. For example, despite having been designed by so-called digital natives, physical books were highly significant in every project; recent research in the US has shown a significant – and unexpected – preference in students for books over digital media for the majority of their long-term reading.⁷ However whilst real books were always present, in the majority of the students' projects they were an expression of a larger concept as much as for reading – such as their cultural symbolism. For example,

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the changing permeability of the dynamic structure in Figure 1 expresses increasing accessibility to the books within, which in turn is representative of the evolving democracy of knowledge.

Several projects explored the wider and more complex roles libraries play as an important civic space and place of social interchange within the public realm. As such, these projects reflected somewhat surprising research, which revealed that the majority of library visitors do not go there to borrow or return books.⁸ In fact, spatial explorations around the activity of reading were notably limited across the projects. It has been argued that libraries are undergoing a renaissance as this traditional building type is re-invented as a centre for culture and knowledge that is being used in new ways;⁹ it is this re-imagination that the students' projects explored in depth.

During the summer after the projects were completed a research paper was written about the changing roles of physical books and library spaces, discussing their civic place in the context of increasing digitisation and cultural diversity.¹⁰ The discourse was structured with the students' projects as the central narrative thread, with issues they illustrated referenced to – and discussed in the

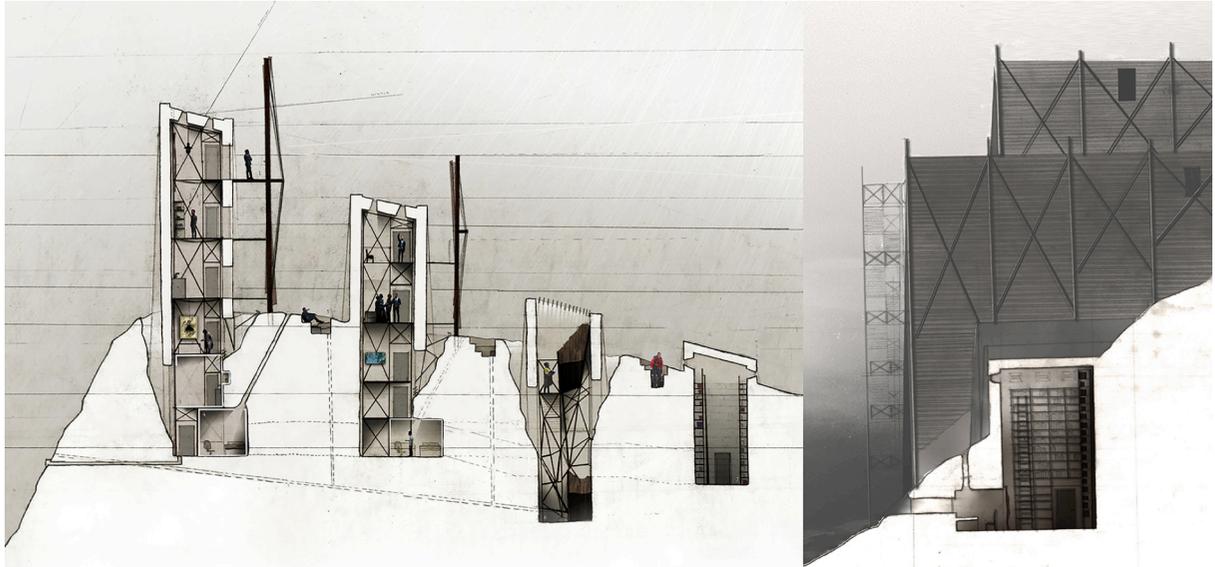


Figure 2: *Experiential Observations (Alex Bodman).*

context of – existing research on contemporary library design identified through the literature review.

A notable aspect of the overall body of work the students produced was its sheer diversity; the projects ranged from a place for storytelling, to a place for writing, a third place, a meteorological observatory (figure 2), a book museum, and an archive. Such a multiplicity of responses highlights an intrinsic quality of the TIR approach; as a divergent process, design projects evolve from a common starting point in a wide range of trajectories. In one of the more well known scenes in the film *The Matrix* the character Neo has to make a decision; he takes either a blue pill to return to the relative security of what he knows, or he takes a red pill to go on a journey into the depths of the unknown. For the researcher – like Neo – the divergent nature of the design process means that what lies ahead on the journey of the research project is similarly unknowable and unpredictable. However, this turned out to be a very positive quality as the paper was able to illustrate a wide variety of different themes and issues. Had all the projects been very similar, that discussion would have been much less rich.

An interesting aspect of this case study was that the tutor had no ambition to create a research output when setting the brief. That idea came after the project submissions when, reflecting back on the body of work that had

been created by the students, their pertinence to contemporary issues in library design became clear. As Schön highlights, design is not simply a matter of solving problems but also of finding out what the problems actually are;¹¹ the projects contributed to understanding in both of these senses.

As opposed to submitting the paper to a journal about architectural education, it was sent to a practitioner journal specialising on the changing role of the library and the impact external factors have on its future development. It went on to win recognition in the 2015 Emerald Literati Awards, and led to the tutor being invited to write a book chapter on the future of libraries in the digital era that also utilised student projects in the narrative.¹² This demonstrates the esteem that research based around students' project work can achieve.

Case Study Two: The Terraced Housing Project

The design of new housing in the UK faces numerous challenges, at the forefront of which is a triumvirate of interrelated needs: to make dwellings more affordable, more spacious and less damaging to the environment. Each of these is important in its own right, but are they reconcilable? Conventional thinking suggests larger dwellings cost more, as does increasing their environmental sustainability, so consequently they become less affordable.

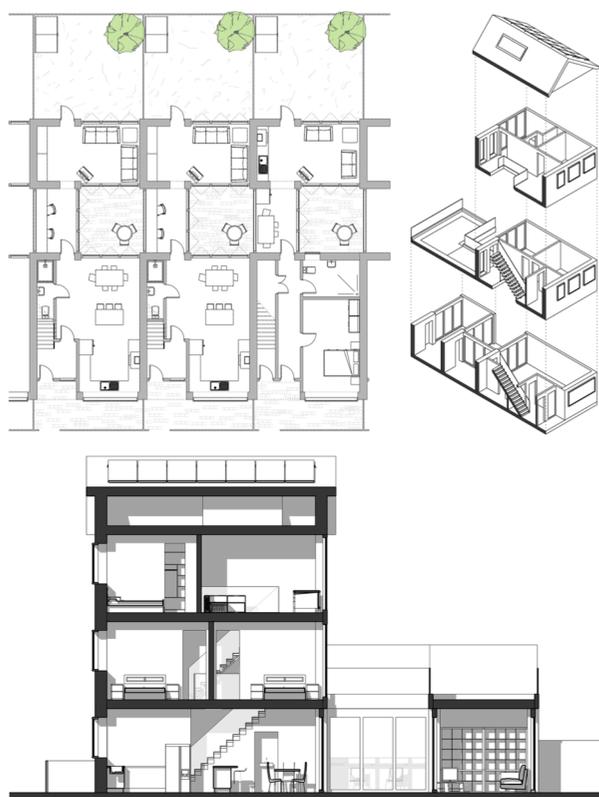


Figure 3: *The Courtyard* (Omar Shariff).

In March 2015 Architecture students studying in the first year of the NQF (National Qualifications Framework) Level 7 MArch programme at the same university were set a project to design housing in Liverpool. They were asked to select one of three typical UK housing types – an urban block, terraced, or detached / semi-detached – again subject to an appropriate balance of numbers within each tutorial group. The terraced housing group were given a site in the Georgian quarter, and were challenged to explore the potential of this typology to accommodate contemporary forms of living, whilst examining the interrelated priorities of space, affordability and environmental sustainability. The module lasted for six weeks during the second semester.

In the summer following submission of the projects a comparative analysis enabled common themes and design strategies to be identified. For example, rather than just considering space standards quantitatively numerous students explored it as a qualitative concept, which led to thinking beyond conventional dwelling spaces and questioning what is actually required in new housing. This is exemplified by the project in figure 3 which, in addition to providing different

configurations of internal layout, also provided the option of additional space for extended family members to live with a degree of independence, or a place to work set apart from dwelling spaces.

The family unit was often perceived as a plastic concept, flexing and changing significantly over time. Some students provided dedicated spaces to enable adult offspring (unable to afford their own dwelling) or elderly relatives to live as part of an extended family; some proposed multiple living rooms so that occupants could relax in different ways at the same time – suggesting that the notion of the whole family gathering around one television is an out-dated one. Other projects proposed dwellings incorporating sliding or folding screens so that rooms could be easily reconfigured throughout the day – subdivided when different activities had conflicting needs and then recombined to create an open plan. In addition to multiple scenarios for dwelling, in many projects the provision of a distinctive space to work from home was a key feature.

The RIBA have argued for more research into what constitutes adequate space to suit contemporary living patterns;¹³ taken collectively these projects make some suggestions toward that understanding. For example, the project in figure 4 proposes two different house shells containing a staircase, kitchen and bathroom. Beyond these, it is up to the end-user how space is tailored to the needs of its inhabitants. This concept was tested by applying three different scenarios to each of the shells and examining how those family types could appropriate the space.

In the first instance the project work was presented at an international conference on housing, which showed the students' work at a formative stage. The tutor was then invited to develop that initial paper into a book chapter, discussing the issues of space, affordability and environmental sustainability in new housing in the UK.¹⁴ Whereas the Book Repository paper used the students' projects as the central narrative thread running throughout, here the projects were discussed in one section within the chapter, using them to highlight key trends and illustrate potential solutions to the challenges that currently face new-build housing.



Figure 4: *Habitus: Homes not Houses* (Matthew Kerrod).

Some Lessons Learnt About TIR

A fundamental quality common to the Book Repository and Terraced Housing projects was that, as theoretical constructs, the students were permitted a high degree of intellectual and creative freedom; consequently, their designs could push boundaries in exploring what libraries and housing could be.

Doevendans, Verbeke and Petric discuss three types of research: questioning-prescriptive, questioning-descriptive and research of the imagination,¹⁵ TIR clearly lies within the latter. This is a highly positive quality to using studio design projects as research methodology – they can explore hypothetical concepts, and imaginative and progressive solutions.

Griffiths argues that research in applied fields – common to built environment subjects, including architecture – is about bringing new approaches to intractable problems and conflicts in the field, and not towards knowledge and understanding for their own sake.¹⁶ The implication of this for the TIR approach is that studio projects must align with

such problems and conflicts. Another commonality between the Book Repository and Terraced Housing projects was a brief to explore building types that are currently facing contentious challenges. To adopt the TIR approach project briefs should respond to – and be interrogated against – challenges in real-world scenarios. Writing briefs that align with contemporary problems and conflicts also strengthens the potential impact of the research, and creates scope for wider dissemination through discipline specific journals in other fields, as well as those in architectural design and education. Setting briefs that challenge real-world problems may be disconcerting for some teachers, thinking that overt focus on realism could inhibit creativity in the design process. It may be that such projects are more suited to cohorts in higher levels, as they are better able to reconcile creative exploration within imposed parameters.

One of the key aspects that makes TIR distinct is the sequencing of the design projects within the research methodology. In TIR the project

work takes place immediately after the research question – the brief – is set. All other stages – including the main body of the literature review and analysis – follow, because these are all directed by how the project work evolves and where it leads.

The case studies described above both followed similar sequences. Preliminary research was conducted to establish the context for the design brief – a standard part of setting any project. The brief was then issued to the students and their projects followed the normal journey for the duration of the module. Once submitted, the overall body of work was comparatively analysed to identify themes and trends. Next, a literature review by the tutor facilitated a deeper level of understanding about particularities raised by the projects. This review identified existing research concerning salient issues in the field of inquiry to contextualise the projects; in both case studies this covered critical matters in design, theory and policy pertaining to each building type.

The research output was then written using the projects to illustrate these issues, drawing on the literature review to contextualise and analytically interrogate them. The Terrace Housing project differed slightly because the conference where the work was presented at a formative stage took place whilst the projects were running; therefore the tutor conducted an initial literature review in parallel with the projects. Further comparative analysis of the projects then took place following their submission, and a more extensive literature review was undertaken before the chapter was completed.

Because the majority of the research processes in TIR usually take place after the students' project work is completed, a potential shortcoming is that the research cannot feed into – and therefore inform – those projects. It is often argued that the benefit of research informed teaching lies in its enhancement of curriculum content, thereby deepening students' learning. However if the project brief is refined in response to the TIR outcomes, then they become part of the foundations for subsequent cohorts to initiate their projects from. This creates a developmental cycle to the TIR method in which each cohort can spring from the previous one. Of course, this does

require continuity – as opposed to reinvention – of project briefs from year to year.

Although a number of students designing Terraced Housing explored increasing affordability through advanced housing manufacture and reducing utility bills, for example, a shortcoming of the subsequent research output was that there was no robust method for those strategies to be costed. This highlights the need for an appropriate evaluative framework through which to critically appraise the projects. In both case studies this was achieved through the intellectual framework created by the literature review, which followed completion of the projects; existing research on issues raised by the students' work was explored, and the validity of the projects in the context of those issues then established.

The Morality of TIR

Questions may be raised over the ethics of students' work being used to inform tutors' research. Is it appropriate that projects produced by students subsequently become material for staff conference presentations and publications; and what issues need to be considered if using students' projects for research?

When briefs are written, it should go without saying that the primary objective is alignment with the module's Learning Outcomes and any validation Attributes or Criteria that are mapped to it. Then the pedagogic framework and creative potential of the brief should be established, ensuring that strong students will be challenged whilst those less capable have sufficient parameters to work within and support their learning. The relationship to a particular tutor's research field should only then be drawn. Put simply, the learning experiences of the project precede any consideration of a research idea. Equally, the students' exploration and final resolution of their project must be the primary focus and outcome; should their work diverge from any preconceived research objective this must be embraced and encouraged. In fact – as demonstrated above – the more diverse the projects produced, the more expansive the comparative analysis in the context of problems and conflicts will be.

If there is no increased demand placed on students beyond completing project work in accordance with the requirements of the module, arguably they benefit from having their work included in research outputs. Whether an international conference presentation or journal publication, these can be included on students' CVs, blogs and websites, thus providing means to promote their design work. It should also go without saying that students' permission should be secured, and acknowledged, for publishing their work.

Another risk may lie in students believing that they have been set a particular project to satisfy the idiosyncratic research interests of their tutor. However, if students select which project they design in a module – as in both the case studies discussed above – should any brief not appeal to them then they simply avoid proposing it as one of their preferred options.

By following these principles, the TIR method should not fall foul of accusations that students are doing a tutor's research on their behalf. It is pertinent to note here that in the recent Higher Education Academy *Student Engagement and Skills Development* survey, some of the lowest scores for student engagement relate to interaction and working in partnership with teachers;¹⁷ TIR might be one way in which to address this through creating collaborative research projects.

Capturing the Student View of TIR

How do students feel about their work being material for their tutor's research, conference presentations and publications? To explore this a survey was conducted of those whose work had been included in the above publications by the author. A questionnaire was emailed to them asking, for example, how they felt about their work being published as part of the research, and if they had any particular positive or negative views on the experience. The participants included students who had long since graduated, so would not be influenced by the tutor-student power dynamic.

Significantly, not one respondent expressed any negative concerns or opinions. Furthermore, all of the respondents identified a sense of pride or pleasure at their work being in print; one respondent said, 'I'm extremely

proud to have had my work included in your publications and it was great to actually see it in the draft versions, never mind the published version.' The majority said that they have included reference to the publication on their CV, blog or online portfolio; one respondent commented that it had proved to be a talking point at interviews.

Interestingly, two respondents highlighted that seeing their project in print had led to further critical self-reflection on their work. One wrote, 'It was interesting to hear your academic opinion of my project ... This allowed me to further think of the design and allowed me to critically evaluate what I did to an extent that I can possibly [sic] change how I design in the future.' This demonstrates that whilst some argue staff research is an irrelevance or even an obstacle to improving teaching quality, TIR can result in a positive contribution to – and enhancement of – the student learning experience.

Conclusions

Each year in every Architecture programme a wealth of innovative project work is produced. Should more of this be captured in research outputs that reach beyond publications on architectural education? If so, students can contribute to the discourse on a range of contemporary challenges and problems in wider contexts through their creative thinking, inquiring minds and studio projects.

There is much debate over the relationship between teaching and research, and how they impact on each other. Hattie and Marsh contend that 'the aim is to increase the circumstances in which teaching and research have occasion to meet, and ... for demonstrations of the integration of teaching and research.'¹⁸ That relationship can be significantly affected by the pedagogic methods of a programme,¹⁹ as both research and learning are informed by the modes of inquiry characteristic to the discipline in which they take place.²⁰ Arguably, studio teaching – with inquiry-centred and problem-based learning supported by one-to-one tutorials – is highly suited to fostering close links between the two.

The experience taken from running the two TIR projects described above has highlighted some key issues to consider when adopting a

similar approach. Firstly, project briefs should be set to explore contemporary problems and conflicts in building types, or the equivalent, which are facing contentious challenges. This creates a relevant field for the research to contribute to. Secondly, the majority of the literature review and all of the analysis generally follows completion of the project work by the students, to explore in depth particularities revealed by the work.

There needs to be an appropriate evaluative framework for the project work – the research data. For example, this could be comparative analysis of the projects, contextualised against issues relating to theory, design or policy in the field of inquiry, identified through the literature review. However, where that field extends beyond the tutor-researcher's expertise, such as detailed cost appraisals or the appropriation of new technologies, then collaborations may need to be sought in order to appraise the students' project work robustly.

Interestingly, in debate over the relationship between teaching and research there are very few arguments that teaching effectiveness makes for better research – a causal link is, almost without exception, sought the other way around.²¹ In sharp contrast, the TIR approach – where research emerges from the outcomes of teaching – makes a very persuasive case for placing excellence in studio teaching at the epicentre of creating good research. Furthermore, when a cyclical developmental process is created year on year, research findings and outputs from TIR can inform and enrich the learning of subsequent cohorts.

Learning, like research, is about formulating knowledge. In the approach demonstrated by the case studies, research develops from the students' project work, which is the product of the design process. There is also potential for research outputs arising out of the iterative development itself that students engage with during their projects, as a form of creative pedagogy. Although beyond the scope of this article – these would equally fall within the concept proposed here of research being informed by teaching. This would fall under Griffiths' category of *research-informed* teaching, which draws on systematic inquiry into the teaching and learning processes themselves.

Either way, when design teaching leads research the path will be an unknown rabbit warren of unanticipated twists and turns. However, embracing this inherent characteristic of the TIR methodology can result in rich outputs; outcomes which align and relate studio teaching to much wider contexts, and thereby lead studio project work into contributing to knowledge in diverse fields of research.

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