Finding focus and balance for contextual reviews in multidisciplinary academic design research

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ABSTRACT

The contextual review of prior studies is a fundamental element of postgraduate research projects but is neither well-established nor fully accepted in design research. Moreover, by comparison to more established disciplines, design research projects are often situated in multiple contexts of use and meaning, such as education, industry, markets or specific social spheres. In achieving sufficient intellectual depth to warrant a claim to scholarship, students and supervisors must often negotiate a difficult trade off between the number and nature of sources deemed adequate for critical analysis and review. Achieving depth while maintaining the research focus is one of the 'wicked problems' for design research. This paper reviews the importance of maintaining scholarship in postgraduate design research where the contextual nature of projects demands interdisciplinary knowledge. It is complemented by an example of a recent applied design doctoral project illustrating the nature of the challenge.

INTERDISCIPLINARITY, KNOWLEDGE PRODUCTION AND SCHOLARSHIP IN APPLIED DESIGN RESEARCH

Distinguishing applied research in design from the individual design problems that characterize design practice, Buchanan (2001) describes such research as developing theories, models and explanations, 'from many individual cases ... that may explain how the design of a class of products takes place'. Buchanan depicts applied research as involving the 'application of fundamental principles' from relevant fields and disciplines (Buchanan 2001:18). Applied research, therefore, demands an engagement with disciplinary knowledge outside the field of design per se, which is traditionally demonstrated through the extent and quality of a student’s literature review. This tenet of postgraduate research can be difficult in the supervision of applied design research projects where contextual issues bring many spheres of investigation into play and projects advance hypotheses beyond the single client solution of clinical research. We suggest that the literature on ‘Mode 2’ knowledge production in higher education provides constructive insights into the scholarship involved in navigating multiple research fields, assisting students and supervisors to better understand the literature review process and to arrive at successful transdisciplinary applications of methods and knowledge.

Gibbons et al. (1994) describe Mode 2 knowledge production in higher education as inherently applied and industry oriented while Etzkowitz (2003) locates it within the triple helix of government-industry-university partnerships. Horlick-Jones and Sime (2004) note that in contrast to conventional disciplinary work, where subjects of investigation, modes of enquiry and methods of evaluation are well established, Mode 2 knowledge production typically combines both orthodox disciplinary-based and non-disciplinary sources of knowledge. For applied design research this is often an effect of the scale and complexity of research questions tackled in an emerging field of investigation. Design-based modes of research enquiry are also not highly refined, having only lately separated from industry practice. Yet this is not unusual to Mode 2 knowledge production, applied design research reflecting applied research in other fields in demanding ‘a form of transdisciplinarity which entails making connections not only across the boundaries between disciplines, but also between scholarly inquiry and the sphere of tacit and experiential knowledges’ (Horlick-Jones and Sime, p.445).

<table>
<thead>
<tr>
<th>Mode 1</th>
<th>Mode 2</th>
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<tbody>
<tr>
<td>• segregated</td>
<td>• integrated</td>
</tr>
<tr>
<td>• university-based</td>
<td>• socially distributed</td>
</tr>
<tr>
<td>• discipline-based</td>
<td>• cross-disciplinary and trans-disciplinary</td>
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<tr>
<td>• ‘pure’</td>
<td>• sensitive to context of application</td>
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<tr>
<td>• hypothesis-led</td>
<td>• social accountability and reflexivity</td>
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<tr>
<td>• deductive</td>
<td>• messy</td>
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<td>• concerned with truth and predictability</td>
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Table 1: Mode 1 and Mode 2 Knowledge (Griffiths 2004:718)

The combination of tacit and experiential knowledge with conventional literature and other sources is arguably a distinctive feature of applied design research. It is also the locus of its greatest strengths and challenges, indicating a young research field where people can take risks and cross boundaries in the search for intellectual catalysts and frameworks though perhaps with insufficient awareness of the implications of border crossing for the practice of scholarship. The use of knowledge and methods from multiple fields resists fixed perspectives and expands lines of enquiry. However, in the face of too much possibility students...
and supervisors can become lost. For Lauer (1984) a requirement of conducting multimodal research is that those appropriating knowledge and methods from other fields understand the full meaning of their borrowings, especially in the disciplinary sphere from which they are derived.

Although concepts of interdisciplinarity often suffer from uncertainties about the nature and boundaries of disciplines themselves (see Becher 1987), interdisciplinarity can involve greater or lesser integration of knowledges. Referring to Klein (1996), Aram suggests that, ‘instrumental interdisciplinarity involves bridge building between fields, epistemological interdisciplinarity involves restructuring a former approach to defining a field, and transcendisciplinarity seeks a movement toward coherence, unity, and simplicity of knowledge’ (382). Applied design research, as exemplified in the project considered below, is often marked by an instrumental interdisciplinarity where, ‘scholars utilize or borrow ideas or methods of another discipline to enhance problem solving within their home disciplines’ (382). Such an exchange entails forging productive links between modes and methods where integrative transcendisciplinarity requires that students achieve a high level reflexive engagement with the nature and purpose of knowledge, resulting in the development of original theoretical and methodological frameworks that operate across disciplines.

Boyer (1990) proposes two models of scholarship, that of discovery as in the established academic disciplines and that of application. The scholarship of application is most consistent with Mode 2 knowledge production and involves research in applied and vocational fields that is ‘oriented not towards knowledge and understanding for their own sake, but towards the use of knowledge and understanding in addressing conflicts, tackling problems and meeting the needs of client and other groupings’ (Griffiths 2004:715). Griffiths (2004) cautions, however, that it is ‘intellectually dubious’ to mix ‘codified, discipline-based (explicit) knowledge’ from outside the applied field with ‘intuitive (implicit) knowledge’ (p.716) from within it. This is a significant issue in applied design research projects conducted by postgraduate students experienced primarily in design practice, expertise in design methods and knowledge obviating the need to understand relations between disciplines while often making knowledge and methods from outside design seem superfluous to the act of problem solving. Recognizing interdisciplinarity in applied scholarship (Boyer 1990, Florick-Jones and Sime 2004) may help applied design research establish its intellectual credibility.

DESIGN RESEARCH AS INTERDISCIPLINARY

The notion that design research by definition engages with multiple fields and literatures is widely acknowledged (Poggenpohl et al 2004), being attributed to the fact that design spans many areas of life while being comprised of various subfields. Bricolage of methods and perspectives also characterizes professional practice and consultancy in design, although standards of scholarship in applied design research require greater depth of intellectual engagement with multiple modes of enquiry. Eclecticism may contribute to the distinctive character of an emerging discipline but it is also an obstacle to the creation of a common language of design. Margolin (2002) attributes this discursive deficit to the private affiliations and allegiances of designers and the perspectives and talk of specialties such as interior design or industrial design. He sees the increasing workplace reality of designers participating in interdisciplinary teams and the growth of cross-disciplinary academic programs as changing this but is insistent that designers, ‘desperately need to learn how to talk with colleagues who do related work’ (p.35). Academic design research, where collaborative interdisciplinary projects are possible, could model this for industry but only if the challenge of interdisciplinarity is met head on and theoretical and methodological bricolage is not just a product of supervisors bringing their idiosyncratic knowledge and perspectives to a student project.

Some scholars see intellectual and methodological bricolage as relatively unproblematic and part of the unique character of design knowledge and thinking. Downton (2003) characterizes the designer not just as a bricoleur who employs knowledge from inside and outside the discipline but as one who explicitly ‘reshapes these knowledges, discards parts, augments parts and juxtaposes elements on the way to proposing a design’ (2003:95). He moreover privileges reflective practice and the embodiment of knowledge in designed objects as an effective conception of academic design research. Others are more skeptical about such proposals. Noting that designers often confuse practice with research, Friedman (2003) observes that, ‘the misguided effort to link the reflective practice of design to design knowledge, and the misguided effort to propose tacit knowledge or direct making as a method of theory construction must inevitably be dead ends’ (p.519). Stepping away from questions of interdisciplinary research for a moment, design researchers also need to accept that it is the nature of disciplinary research to challenge disciplinary values, methods and knowledge not take them for granted as often happens in design practice, disagreements and theoretical shifts inside disciplines being an important source of their intellectual rigour and vitality.

To achieve an exacting scholarship design researchers and postgraduate students must resolve the relationships between the theories, concepts, and results of precedent studies that define the intellectual platforms of their projects, as well as those that define the emerging contexts of the discipline. Otherwise design risks accusations of intellectual scavenging and naivety, limiting its ability to transcend its own institutional channels. Recognition of design as epistemologically and methodologically valid by more established disciplines is equally unlikely unless such shortcomings are addressed, precluding design from the benefits of interdisciplinary interest and collaboration. To this end the contextual review of discipline-based literature and other sources is vital to the capacity of design research to
develop and exemplify standards of interdisciplinary scholarship.

THE CONTEXTUAL REVIEW IN APPLIED DESIGN

In established disciplines the literature review is the recognized vehicle for the evaluation of existing sources relevant to postgraduate research projects. Numerous texts provide useful guides to the critical review of textual sources in the discipline-specific scholarship of discovery (e.g. Hart 1998; Oliver 2004; Wallace and Wray 2006). However, the interdisciplinary scholarship of applied design challenges this primarily textual mono-disciplinary model. In design research, invoking disciplinary and non-disciplinary sources is sometimes distinguished as a contextual review (see Gray and Malins 2004). The term has its critics. Durling (2002), for example, is scathing of its ‘fashionable’ use in practice-based design research, noting that it is mostly subjectively defined by the researcher’s personal interests and limits, producing, ‘a loosely structured survey that is not intended to be exhaustive. (p.82)

For Durling, whether a piece of research makes an original contribution to knowledge can only be established, ‘if such a contribution can be compared with the state of knowledge in the field in the period preceding the study.’ (p.82). He seems to equate the contextual review with clinical or workplace research where the aim is to stimulate fresh insights rather than to be rigorous in a scholarly sense, disregarding the problems making complete recourse to ‘the literature’ causes for applied research questions that can only be properly investigated from multidisciplinary frameworks. The remaining discussion is based around a recent example that explores how to manage the review of prior knowledge in multimodal research projects. It is an example of student supervision in a professional doctorate, where the applied research framework is explicitly relevant to design (see Barron, Anderson et al. 2005).

STUDENT CASE STUDY

As Wisker (2005) notes that narrative case studies are widely used for reflective practice and doctoral supervision training and discussion. An in-depth focus on a single case can be as valuable as a broader comparison of a number of examples. The case study below has provided for the authors reflection on the challenges of supervision and informed some changes to practice. Within the limitations of this paper, it is hoped it also provides ‘food for thought’ for readers and exemplification of the issues discussed above.

A recent professional doctorate exploring flexible interior design for Taiwanese cluster housing developments exemplifies how the effort to understand the wider problem context and consequences of design recommendations in applied research projects engages widely dispersed bodies of literature. In this and other recent student projects, while multidisciplinary borrowings meaningfully inform the investigation, an over-arching sense of the research focus is crucial to limiting reading to what is feasible. At the same time a coherent synthesis that achieves a level of epistemological interchange in the research outcome is crucial and a challenge. The student, an experienced interior designer and design educator, undertook doctoral study to address a real-life problem he had routinely encountered when called on to redesign the interiors of newly purchased housing units that did not match their owner’s needs, a common occurrence in Taiwan made difficult and expensive by the dominance of concrete as the country’s primary construction material.

The student’s aim was to contribute new approaches and practical knowledge to his discipline and to Taiwanese society through the cyclical process of problem identification, reflection and conception common to design practice. He found the need to systematically seek out precedent studies in unfamiliar disciplines both difficult and frustrating, given his eagerness to begin designing. Fortunately, the search for relevant knowledge and modes of enquiry—although ranging across architecture, user-centered and participatory design, supply chain management, customization principles from product design and manufacturing, marketing, housing studies, urban design, and theories of Open Building and Open Source Building—eventually produced a fairly consistent set of knowledge relations. There was throughout this process a strong onus on the authors – experienced and novice supervisors to also take on the burden of reading with the student through this scattered literature to identify essential points and synergies.

The research established that while flexible interior design was addressed in areas of engineering, housing studies and architecture, few studies came from a user-centred interior design perspective and no specific study existed for Taiwan. Wide reading was especially useful in challenging his epistemological understanding of interior design, especially its tendency to propose abstract responses based on the manipulation of space and form to real-life issues. For example, studies in housing and supply chain management showed that altering design characteristics across a category of buildings required wide-ranging intervention and cooperation at many levels of industry and government. Housing studies and urban design identified diverse implications of poor housing for societies, including Taiwan. Armed with this information the student was able to raise both sharper and broader arguments about the impact of current interior design practices in Taiwan.

However, for a research student from a practice background identifying, acknowledging and navigating the epistemological, methodological and ideological differences between diverse research fields and methods was challenging. In particular, values and assumptions from the fields of engineering, manufacturing and marketing threatened to overwhelm the theories of user-centred design that inspired the project. The former typically applied quantitative models to the proposition of flexible design and construction, stressing the delivery of cost savings, time efficiencies and competitive market advantage to construction businesses. The adaptable interior design system proposed in the student’s research application expressly opposed the inflexible,
developer-driven approaches entrenched in Taiwan’s cluster housing market where short-term profitability impels housing development. Strong fiscal or rationalistic principles and validation methods from outside design stressed efficiency and improvement in industry practice over the project’s interest in empowering homebuyers and designers to achieve housing outcomes responsive to human and social needs.

The student was determined to maintain his insider status in relation to the research issue and to validate the professional knowledge of interior designers in a social context where developers hold power. The need to establish existing knowledge and exhibit critical objectivity in analysing both the problem itself and information and methods from outside design risked transforming the research into a process of disengaged observation and commentary. The time and intellectual effort required to synthesise information from relevant studies significantly reduced the scope for design work. Although the rigorous engagement with abundant multidisciplinary knowledge made the research more theory-driven than practice-based, the outcome gave a much fuller diagnosis of the issues facing Taiwan’s private cluster housing sector and their potential solutions. Considering the problem from multiple perspectives was important in validating both analysis and recommendations, adding weight to the design work while providing the basis for the student to mount an ongoing, multilateral stream of funded research into the design of housing in Taiwan on completion of his project.

**DISCUSSION**

This paper claims that applied design research in higher education demands students and supervisors engage with a form of interdisciplinary contextual review that is distinct from the text-based disciplinary review of established academic disciplines. The multiple fields and multimodal sources of such a review help constitute and validate the scholarship of application proper to industry oriented Mode 2 knowledge production in universities. This systematic contextual review is distinct from the frequent intellectual subjectivity that characterises industry-based practices of the design studio. The early phases of the doctoral experience involve institutions and supervisors complementing the professional competence doctoral students bring to their project with the academic literacies the scholarship of application has developed to engage with complex, real-world issues, though whether this specifically focuses on interdisciplinary research processes is doubtful. In the current debates about the nature of design research too little concrete attention is paid to justifying claims to the particular nature of such research and we suggest that the student case study puts this in perspective. Following Wisker (2005), we also suggest that narrative case studies provide significant material for supervisor reflection on pedagogy practices. The authors propose that further student case studies and the development of definitions and characteristics of the nature of interdisciplinary design research activity be undertaken in the future in the aim of aspiring to actual transdisciplinarity.

**REFERENCES**


