



Reliable knowledge in design  
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## Background

Over the past few years, the field of design has been riven by arguments over the nature of research and practice. There are still confusions even in defining what the term 'research' actually means, with the distinction between research and practice being ambiguous. Similar confusions continue to attend the regulations for research degrees, with wide differences in expectations between different universities and traditions. This debate has been most intensive in the UK mainly due to the considerable changes in university level education which have occurred quite recently.

The origins of art & design education in the UK derive from a well established model of art and design schools dating back, in some cases, well into the 1800s. These were characterised by an apprenticeship in the craft of making art and design. For design, up until the 1960s there was a nationally accredited National Diploma in Design (NDD). Courses were often formed in the guild traditions of mastery of craft skills.

A considerable change was effected with the introduction of the Diploma in Art and Design (DipAD). The vocational training element of design practice continued in the DipAD, though changes to the curriculum were made, the most obvious of which was the extent of theoretical and contextual studies which legitimated the DipAD as an equivalent to a first degree. After a short life during which academic rigour could be demonstrated, the DipAD was replaced by a BA degree. MA awards became a natural extension of practice at the undergraduate level. At the time, few degrees in design were offered by universities, and it was usual to attend an art school or other higher education college. A large number of awards came to be offered by Polytechnics. Standards in the new awards were accredited nationally by the Council for National Academic Awards (CNAA) a body that set rigorous (some would say onerous and unnecessary) conditions for the validation and continuance of awards.

After 1992, there was a significant change of status from polytechnics to new universities having the ability to award their own degrees. Universities are able to conceive and

implement their own degree programmes based on their analysis of the needs of potential recruits in the various subject areas offered.

### Transition to PhD studies

So much of the discussion emanating from those who appear to want to modify or extend the PhD to accommodate practice ignores the history of the development of the arts and craft courses into the BA. The BA did not change, it was there all the time. Design changed to fit the special conditions of the BA. Similarly, the PhD was there already. The PhD has a form arising from its traditions of philosophical inquiry. That is why it is a Doctorate in Philosophy. The PhD is a research degree and has a particular form arising from the traditions of such philosophical inquiry.

It is therefore not the PhD that needs to change to accept design practice, it is design practice that needs to fit the form of the PhD. If practice does not fit the form of the PhD, then the PhD is unsuitable for that practice.

### Practice and research

Prior to the early 1990s and the imperatives of the Research Assessment Exercise (RAE), the quantity and quality of research within departments of Art & Design was very variable, ranging perhaps from very good research through to a large number of departments with no discernible research culture at all. Among design practitioners, there was practice, consultancy and exhibitions, but very little work that centred on design science, the building of theory, or the reporting of empirical results. Practice was felt to be important in keeping practitioners up to date in their subject skills, with the day off for consultancy and personal development being coveted. Conversely, those in theoretical and contextual studies often drew upon long established models of scholarship common in the humanities, especially historical studies, and these were mainly centred around dissemination in a written form. The legacy of this situation is that there are residual epistemological confusions about the nature and role of research and the dissemination of its findings. Perhaps the most contentious debate has centred on the role of design practice and whether practice is research, has equivalence to research, or is itself a research method.

In the UK until the 1992 RAE, the term 'research' seemed to be applied only to certain empirical work and to certain scholarly activities typical of for example art & design history. Following the scent of funding, everyone became a 'researcher' irrespective of whether they had been content previously to pursue their design interests through practice, consultancy, craft, course development, committee work, writing, testing, archiving etc.

The term 'research' means quite different things to different people. For some it indicates investigation, for others it indicates practice. For some it refers to objective findings, for others it refers to subjective opinions. Some work is disseminated through refereed journals, while other work is exhibited.

One such confusion is the application of the term 'research' as defined for the PhD to be the same as the term 'research' as defined for the RAE. It may seem logically inconsistent that the term 'research' can mean two quite different things, but the genesis of each is quite different. As design staff were so recently galvanised into trying to fit what they already did into the definitions of research for the RAE, it is no surprise that these definitions are still being worked out. The RAE is a benchmark of the quality of activity

across all university departments. The generic definition of research includes elements of practice, but the criteria for any individual Unit of Assessment are shaped by the individuals who comprise the panel. These criteria vary widely across disciplines. There is no obligation on a panel to adopt criteria that would be suitable for the PhD. The national assessment of design and art has to address a wide range of issues of practice, scholarship, and pedagogy which are not similar to, and not in the same category as the kind of research required for the PhD. The RAE is an assessment of a different kind, and will change somewhat from exercise to exercise. The PhD on the other hand, should not.

The derivation of appropriate research for the PhD has arisen from the long tradition of philosophical inquiry across various disciplines. The form of the PhD stands there for all to use. Design may best see how it might fit itself to the PhD but not the other way around.

## Focus

It may be instructive, in considering some problems in the definition of quality aspects of research in design, to focus on what constitutes research for the award of our highest research degree, the PhD in design. This award is (or should be) given for supervised research leading to a published outcome. The PhD has a long tradition in many subject areas, and whilst it is relatively new to design, there are certain common features of the PhD across disciplines that have been developed over the years to ensure reliable knowledge is produced, is added to the corpus of knowledge published in the domain, and can be subsequently located and utilised by future scholars. The PhD form also allows the work to be interrogated by other scholars and its methods, findings and thesis (in the sense of central argument) may be challenged.

## PhD

Study for the award of the PhD is a research methods training that admits the holder to the ranks of professional academic researchers. It should constitute a programme of study that includes formal training in research methods both generically and specifically to the candidate's subject area. It will have established prior art in the field of study. It seeks to define a question or questions to be investigated, and then systematically addresses those questions. The findings and the analysis are published. The programme of study therefore makes very specific demands. The form of the PhD necessarily follows these research intentions. There is as yet little tradition of doctoral study in design, and we may learn a great deal from experience gained in other relevant domains.

## Research culture

Across the art & design sector, we have some way to go to establish a research culture that understands and manages doctoral education well. There are several pointers. For example, there are still so few in design who themselves hold the PhD. It is therefore not surprising that the form of the PhD is not understood fully.

I believe that there is now being developed a dangerously self-sustaining loop which does not understand doctoral level study, is characterised by weak supervision, does not provide adequate training, and may lead to weak examination at viva. The loop looks something like this. The supervisor without an earned PhD weakly supervises a candidate to completion. There is an inadequate research methods training programme, and the doctoral study is deeply flawed. An examiner is chosen who also does not hold an earned PhD and who similarly has a weak grasp of the issues surrounding the nature of PhD level

study. The candidate passes. The loop continues. This is already happening. There is clear evidence emerging of doctoral programmes having been started with little thought or planning to support this level of inquiry. In the worst cases there has been no research methods training at all, and little guidance in what candidates should do apart from a vague notion of experimenting with some extended practice for three years.

In many new universities there are currently few PhD holders. Therefore, the regulations for supervision are lax. For example, it is usually required that lecturers on a BA programme would hold the BA themselves. Similarly, for tuition at the MA level it seems usually a requirement for tutors to hold the MA. At the PhD level there seems often no requirement that a supervisor holds the doctorate. It is partly due to there being so few in design, but this also brings with it an indifference to the issues of quality in the management of doctoral supervision. We expect at BA and MA levels that tutors have a corresponding qualification, why therefore should we be inconsistent about the PhD level?

It is fundamental that we move towards the position that to supervise a PhD candidate a supervisor should have an earned doctorate. Students should expect that their supervisors are so qualified. In the short term there will be exceptions, but this should be our aim, backed up by training in supervision techniques.

## Research

As previously mentioned, there are several definitions of the term 'research', but many of these are used very loosely. For example some common uses of the word research are taken to mean the following:

information gathering: research where design students undertake information collection as part of their studio practice.

inspiration: research conducted by leafing through magazines looking for inspiration by viewing the latest trends, products and services.

design practice: research through the act of practice based on the notion that new knowledge is derived from practice.

observation of process: research by the many ways of observing the processes of designing.

questionnaires: research by collecting information through questionnaires.

production of pedagogic materials: research as the collection of information prior to the production of materials for teaching.

reading: doing research by reading a lot.

meetings: research through discussion, for example with practitioners.

market analysis: research often restricted to the performance of companies and reported trends.

experimentation: research often used in the context of trying a new material or technique. There are undoubtedly many more interpretations of research activity. Where these individual methods or techniques are employed based upon sound foundations of theory, where the experimental design has been thought through carefully, where analysis may be made through particular protocols, and where there is dissemination of findings beyond the studio, these may contribute to research aims and extend knowledge in the domain. Frequently they do not, because they are not well framed and systematic.

Systematic inquiry, on the other hand, is research which leads to reliable, generalisable findings or theories that may be replicated or reused in some way by future scholars. It is this meaning that is the basis of the PhD as "careful search... systematic investigation towards increasing the sum of knowledge" (Chambers 1993: 1464). But how does one search carefully and systematically?

## Systematic inquiry

In the case of the PhD there are several pointers to systematic working. Put simply, the PhD form may be characterised by:

agree a question or questions to be investigated

undergo a research methods training

undertake a comprehensive literature review

identify the methods to be employed

design the means of investigation

collect data

analyse findings

answer the questions originally posed and make generalisable statements

capture the whole process and findings in a written thesis

publish the thesis

Why should this be so? It is worthwhile to investigate some points arising from this list that characterise excellence in research and the laying down of reliable knowledge.

## The research question(s)

PhD research must be focused on providing the means for a grounding in the craft of research. It is learned by doing, under the guidance of supervisors. Framing the research questions carefully provides a primary focus for the candidate and supervisors as the study progresses. Design is by nature an eclectic process that, in the commercial context, is probably characterised more by opportunity seeking than by problem solving. Doctoral research is quite the opposite to eclecticism. It is a study which brings these investigative questions into sharp focus, and sustains that focus throughout the duration of the study.

## Research methods training

Depending upon their previous experience, candidates should be given a training programme which seeks to provide a grounding in the traditions of research and the methods broadly available, together with whatever specialised methods training is required for the particular study. It is important that the candidate has an appreciation of the complete toolbox that is available, as well as being able to select and use the appropriate tools found there. There is a very wide range of methods available and appropriate to design research drawn from other fields of inquiry and from design itself. It is not enough to expect that research methods learned at the MA level will suffice for PhD level work.

## Literature review

The literature review is conducted in order to establish prior art in the field of inquiry. In order to operate as a professional researcher, it is necessary to establish what previous researchers in the field have established, and what work is being conducted currently. This is not a trivial undertaking, it is a major part of the PhD study. For those working across disciplines, which is often the case in design research, it may mean deep searches in several other disciplines. This may entail visits to various libraries, searching different databases and, increasingly, conducting web searches which entail precise framing of the information required. It is necessary to develop deep skills both in where and how to find the information required.

It is here that the notion of a 'contextual review' breaks down. This is not a full scale literature review as required at this level of research. Presumably, this was a notion proposed and legitimated by a report on practice-based doctorates (UKCGE 1997: 28) which has been so readily seized upon by those involved in practice-based doctorates. Some of this confusion probably continues to arise from the earlier CNAA regulations which are still in use by many new universities. The aim of a contextual review is to locate the practical work undertaken as part of the doctoral study in its particular field of practice. This may be appropriate for Masters level work, but not for the PhD. The PhD demands a more extensive and secure establishing of prior and current art in the field and cognate fields that influence the study. The PhD candidate must demonstrate this clearly and in an integrative discipline such as design this will entail wide ranging searches and analysis.

One recent successful PhD thesis in design, which has a contextual review, indicated that a primary search conducted with the Allison Research Index in Art & Design (ARIAD) revealed no prior work in the candidate's field. The ARIAD, important though it is as a ready source of information on art & design research, has never been a repository of all research in design. In fact, it holds very little of the work completed in design, and whole university departments are missing entirely. A thorough literature review would have systematically worked through all available sources - of which there are a great many - and established prior art. The study failed to do that, and it may be argued that the thesis should have failed on that flaw alone.

In addition, the collection of information derived from such searches requires storage, cataloguing and sifting. Extensive reading must be matched by extensive note taking and archiving in such a way that the growing resource may be searched and items retrieved. There are skills to be learned in the doing of this. Though the days of the PhD's 'shoe box' are probably over, and databases are now used, the techniques for establishing and using databases must still be learned.

### The primary investigation

Careful thought must be given to designing the means of investigation. Research seeks primarily to extract reliable knowledge from the world, and tries to articulate that knowledge in such a way that that others may reuse it. This supposes that the results of research will have been sufficiently abstracted and generalised. It is not the individual case that is important, it is the generalised statements that may be made arising from this case that are important to the development of the domain.

Research therefore has goals quite different to practice. It asks questions, selects appropriate methods, tests the questions, objectively analyses the results, and disseminates the conclusions unambiguously. In so doing, the best research lays bare the bones of the processes of investigation, and discusses the strengths and weaknesses of the results. It lays down reliable knowledge that future researchers may follow, and methods that may be repeated if necessary. These are research goals. Practice does not have these goals. Practice therefore, by itself, is not an act of research. However, reflection on practice may be good research. Practice may therefore be employed as a significant part of the process of research so long as research imperatives are followed systematically and objectively. Practice must therefore be grounded in clear research intentions.

There is also the question of objectivity. Increasingly, designer-researchers who investigate their own work will encounter the problem of their work being seen to be valid,

objective and reasonably free of self interest and bias. In other fields researchers go to great lengths to distance themselves from the accusation of bias. It behoves us to do the same. This is an unnatural posture for designers, who work in intuitive and subjective ways.

Let it be clearly understood that there is no objection to practice being part of a PhD programme of research, indeed it should be welcomed. Such practice must however be conducted within the very specific academic constraints of the PhD. Most practice, whether within the academy or in a commercial setting, is not framed in a research context and the process is not transparent, transmissible, and publishable. These are however the qualities of good research.

### Write the thesis

The written thesis is of course the device favoured traditionally by true scholars. For those with an earned PhD to their names, it is second nature. For a thesis to be effective, it does of course require a background rich in reading across all relevant subjects. As design is so much at the intersection of other major disciplines, a well constructed thesis requires knowledge of these studies, including their historical antecedents. The subject areas that have 'design' (DRS) as a common subject must also be well understood.

It is necessary to argue one's position in a thesis. The term 'thesis' (Chambers 1993: 1797) apart from being "a long dissertation, esp one based on original research and presented for a doctorate" also means to 'set down'. Thesis is a firm position, a heavyweight position, and represents a definite setting down of knowledge based on fact, history etc.

The thesis is also the means of laying bare the bones of the work done. It is incumbent upon the PhD candidate to detail fully the whole process of the research, such that both the conclusions and their antecedents may be scrutinised. The thesis should take a position and argue it fully.

It is also important that the research is documented fully in the thesis such that the thesis is a complete record in itself. This is not to say that it cannot refer to an external body of work, simply that the thesis should be self contained in respect of the documentation of process and the position it takes. An artefact developed during the work might be referred to and recorded in the thesis, but would not constitute a clear explication of the process of research without this interpretation. The artefact cannot speak of the research process, by itself, to the level of articulation required of a PhD.

### Publish the thesis

It is also incumbent upon researchers to publish their findings. This is important for three reasons:

it is the way in which knowledge is laid down in the domain

it enables future researchers, including PhD candidates, to establish prior art

it allows us all to interrogate the work and to challenge its findings

In order to satisfy these points, researchers must be able in the future to get hold of a copy of the thesis through the normal means. This may include publishing through the British Library, through published CD-ROM, or potentially through a website. While the first is a robust and enduring means of dissemination, the second may have a short life, and the third as yet has no imperative of durability nor any standards for access in the longer term.

It is only by means of publication that the work can be peer reviewed fully. Some believe that the viva voce does that, but this is not so. The PhD is examined on the thesis that is presented, and on the basis of the thesis the candidate is admitted as a fully professional researcher who is able to conduct research independently. The viva is the means by which the candidate can defend his or her thesis against challenge, and for the examiner to confirm impartially whether the work belongs to the candidate. It is an external check on quality, but the larger and more meaningful impact on the domain comes from the review by peers of the thesis and subsequent publications.

There are different traditions of peer review. In some areas of design there is a tradition of dissemination of practical work by exhibition which in turn attracts informed opinion. While this may inform the field and add to the discourses of design, as a process it falls far short of impartial and objective peer review. At the present time, journals such as *Design Studies* - still the preeminent journal in the field - (*DRS: journals*), *Design Issues*, and some of the more recent specialist journals for example '*Digital Creativity*', may be judged to remain exemplars of acceptable peer review.

It follows that publication by exhibition alone would not satisfy these requirements. However, if the exhibition were accompanied by a substantial catalogue explaining the process, it may be argued that there is an enduring record that can be published. If the catalogue contained all of the elements of a PhD thesis and were published and accessible, then it would satisfy these points. It would then stand alone with all of the process embedded in it, and would be indistinguishable from a conventional thesis. The extra burden of exhibition would seem to be unnecessary in these circumstances.

It is expected that the PhD will make an original - some say significant - contribution to knowledge. That contribution cannot be made fully unless the work is published for external scrutiny, and unless it lays bare the work done such that future scholars may determine their confidence in its conclusions.

Some have argued that the art schools, and particularly the studio culture, have been a hothouse of ideas that have extended the knowledge base in our domain. Such things have influenced the culture and practice of design, but they have manifestly failed to lay down reliable, objective and generalised knowledge about design that is reusable by all. Such knowledge, as comes forward from the studio, rarely rises above surface, above opinion, above technique, and is often not published beyond the studio. In the form in which it arises, it is not suitable for the PhD.

There is another dimension. We design researchers generally work with other professionals both within the academy and outside and it is important, if we are to achieve and maintain credibility, that the work we do is demonstrably to a high standard in terms that others may understand. One way of doing this is by achieving the highest standards of research in the PhD.

## Summary

The kinds of confusions which have arisen in the art & design sector about definitions of research and the implications for practice in the process of research, may be informed by thinking through what a PhD programme is, and how it differs from extended practice.

Before design can really begin to build a corpus of reliable knowledge, it will be necessary for us to clear away these confusions about the nature of research. A focus on our highest research degree, the PhD, is one way to help us in this task.

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