

DESIGN, PRACTICE AND RESEARCH: INTERCONNECTIONS AND THE CRITERION-BASED APPROACH

Roberto ROCCO¹, Michael BIGGS² and Daniela BÜCHLER²

¹TU Delft, NL

²University of Hertfordshire, UK

ABSTRACT

This paper examines the connections between research, and practices of design including research by design. The paper argues that owing to different worldviews, what constitutes an effective practice within each paradigm is different. The received paradigm of scientific research benefits from high levels of coherence between its aims, methods, and outcomes as a result of many centuries of refinement. Alternative paradigms can be strengthened by reference to these structural features. If design wishes to develop a coherent response to the demands of design research it must therefore find a way of analysing the fitness of its practices to its problems and audience needs. This should come from a criterion-based analysis of research per se, plus any discipline-specific needs of design. The authors are working on a major project to develop such analyses, and this paper discusses their criterion-based approach from a theoretical point of view, and in relation to the Research by Design doctoral programme at TU Delft.

Keywords: Research by design, criteria, paradigm, academic research, worldview.

1 ACADEMIC RESEARCH IN AREAS OF CREATIVE PRACTICE

Research is an activity that has been variously described but broadly consists of finding or constructing new knowledge or interpretations. As such it responds to what is considered both “new” and “knowledge”, etc. and forms part of a complex network of concepts around what it is to know something in a discipline, and how one might set about the task of usefully extending that body of knowledge. Aspects of these networks of concepts are discipline-specific, and respond to the requirements of knowledge in a subject such as design. Other aspects are generic, and can be found in all disciplines, although they are perhaps framed differently in one subject compared to another (UKCGE 2001: 16, Rust et al 2007: 46). Therefore one of the challenges we face is to discriminate between terminological and conceptual differences. The commonality between subjects allows us to apply the same term “research” to diverse activities in all fields. The degree of comparability may range from synonymous to family-resemblance. However, the semantic argument regarding generic research content is not the argument we will pursue in this paper. Instead we will argue that discipline-specific concepts regarding research are indicative of different worldviews. For example, broadly stated, i.e. with due acknowledgement of the complexity of much contemporary thought; the sciences believe in an independent external world, and that it is the task of science to find out about that world. This basic belief set is called a worldview (Guba & Lincoln 2005). Each worldview has consequences for its subscribers. In the scientific worldview the idea of evidence, which means the idea that there is a correspondence between what we think and what we find, is fundamental. As a result, the idea that one can verify a thought or theory through empirical inquiry is also part of the fundamental set of concepts that bind ideas to this external world. This forms a set of beliefs that determine what counts as knowledge, e.g. theories that are based on, and demonstrated by, empirical evidence that is independent of the observer. But this is not the only possible worldview. For example, in literary interpretation one expects to find a particular theory “insightful” rather than objectively true. It informs us about the relationship that the author and other readers including ourselves, could have to this text, and therefore we learn about the significance of this text. Such signification changes over time and texts fall into and out of fashion, often driven by changes in interpretative theory that valorise new readings of the same text. This literary worldview tells us more about the human subjects and contemporary thought, than about the apparent subject of the literary text.

The scientific worldview we have described has been dominant for many centuries and is often called the “received paradigm”. The literary worldview is one of many emerging “alternative paradigms”. Each is a response to a set of basic questions about the world and our knowledge of it. The first is an ontological question: what kind of things can we know? The second is epistemological: what is our relationship to that knowledge? The third is methodological: how does one go about finding this knowledge? Owing to fundamental differences in the target of research as an activity, each worldview produces a different set of responses to these questions. For example, our method in the received paradigms is to find repeatable data that will demonstrate the objectivity of information about the world. In the alternative paradigms this is pointless owing to the ontological belief that the world is more or less constructed by us as humans when we observe and comment on it. In the latter, the methods therefore concentrate much more on revealing the nature of human understanding of the world (Heron & Reason 1997).

Because it too can be located in Guba and Lincoln’s (2005) cluster of alternative paradigms, Practice-based Research [PbR] may be a unique research paradigm. The question for us is whether PbR is actually a new paradigm, or whether it is a variant on existing “creative” or constructivist paradigms. One of the difficulties in dealing with this question is that the exact nature of PbR is ill defined (Rust et al 2007: 10f.). There are many labels for this kind of activity, including practice-based research, practice-led, studio-based, etc., and also many claims about what it does and whether it is unique to the creative arts, or in fact a use of practice that can already be found in the medical professions, counselling, law, etc. We do not offer an answer to the question in this paper because it is the subject of our current research project “non-traditional research and communication” [NtKC] at the University of Hertfordshire¹. NtKC seeks to analyse the instrumental concepts and actions in established research paradigms in order to highlight the extent to which PbR shares them or is novel. What we do offer in this paper is a set of approaches for answering this question, as a work-in-progress.

2 THE CRITERION-BASED APPROACH

We start from certain minimal assumptions that nonetheless need to be made explicit since they determine some of our fundamental reasoning. One key assumption, following Newton², is that research is a cumulative process. This helps to differentiate two common and non-interchangeable uses of the term: in academic research; and in personal research. In the latter, one is concerned to find out about something that one does not already know, but which other people may know already. As such it is personal development. In the former, one is concerned to find out about something that nobody knows, and will result in a contribution to knowledge and understanding (Biggs & Büchler 2007: 66). If research is defined as being cumulative then it is clear that one is concerned with academic research, and therefore the methods need to include research into what has been done already, and making the outcomes public so that other researchers do not duplicate the work, etc. It also clarifies that research is something done by communities for collective benefit rather than by the lone creative genius who does not wish to exhibit or perform his or her work. In addition to the axiom of accumulation, we assume that there are criteria by which research can be identified and to which it should conform. Such criteria are complex to identify because they both constitute, and are constituted by, the works themselves. However, this is not an intractable circular problem as the authors have described elsewhere (Biggs & Büchler 2008: 7). As a result of assuming that these criteria become constitutive, we end up with the notion

¹ <http://r2p.herts.ac.uk/ntkc>

² Newton wrote ‘If I have seen further than other men, it is by standing on the shoulders of giants’ (*Letter to R. Hooke* February 5, 1675). This has become so synonymous with the process of academic research it has been adopted as the motto of the ‘Google Scholar’ search engine.

that the analysis will be normative: that is the outcomes can be used as standards both for the identification of an instance of practice-based research, and also for an assessment of its quality. This is of consequence for the institutional evaluation of research quality, and the formation of policy.

Initial work by NtKC has precipitated a set of four generic requirements that must be met by research in all disciplines; and a set of four issues that are discipline-specific and present concerns for the creative and cultural industries in particular (Biggs & Büchler 2008: 9). The generic requirements consist of “question and answer”, “method”, “knowledge” and “audience”. These can be construed as a network of interdependent concepts. Assuming that research is cumulative, one needs a question in order to provide an answer to it. The answer will add to our knowledge and to what is understood. The question will arise in a context for which there is an audience. This audience will judge whether the outcome is a satisfactory or relevant response to the question, and therefore whether they are any the wiser as a result of the research. The appropriateness of the answer to the question for the audience will be reflected in the use of methods that appropriately connect one to the other, and are used by the community who form the audience for the outcome. Thus we see that for a community, certain questions are relevant, certain actions are appropriate, and certain outcomes are of interest to their concerns. These communities constitute disciplines, but also share beliefs about what they are doing and therefore inhabit the same research paradigm. All research paradigms can share these four criteria, but the terminology by which they are expressed may vary from one to another. For example in the arts we do not usually use terms such as question and answer, but instead “issue” “theme”, and “response”, “contribution”, “work [of art]” (Biggs 2003), etc.

The second four issues are discipline-specific, inasmuch as they were identified with reference to the concerns and interests of research in the creative and performing arts. However, they may also be indicative or symptomatic of a new underlying paradigm. The discipline-specific issues consist of “image and text”, “form and content”, “rhetoric” and “experience”. These should be considered in relation to and in terms of the earlier network of interdependent concepts. In the creative and performing arts we have an interest in non-linguistic forms of communication, and so in addition to what we say (text) there is also what we show (image³). However, since we are interested not just in images (etc.) that illustrate but which are instrumental in the inquiry or its communication, there is a need to separate the non-textual form, which is inconsequential, from non-textual content, which is consequential. This would involve a shift in the dominant voice of the academy that is text-based, and has led to an emphasis on propositional forms of knowledge rather than other forms of knowing. We would describe this as a shift in the rhetoric of the academy. Finally, all arts prioritise the subjective experience: by which we mean the reception of the perceiving subject. This may be one characteristic common to all alternative paradigms, being in contrast with the objectivist stance of the received, scientific paradigms.

The methodological approach of NtKC is therefore to apply the two sets – of requirements and of issues – in order to first identify a recognisable research activity, and then to enquire into its special characteristics. The project team does this in order to address the question whether research in areas of creative practice is different from traditional research practices. Using this method the results are grounded in the language and precedent of existing paradigms, whilst explicitly identifying any departure from those norms. This method can be applied on a case study basis, and the one reported here is the Research by Design doctoral programme at TU Delft, with which the project shares a relationship. The authors have considered the second set of four, discipline-specific issues in relation to the subject of

³ We intend the term “image” to include all senses including sounds, tastes, etc.

Urban Planning in this programme. In this way, it is possible to explore, in the Research by Design course at TU Delft, how these four discipline-specific issues are addressed through a self-proclaimed PbR doctoral programme.

3 THE CASE STUDY

In the field of urban planning and design, the relationship between text and image is crucial because images (illustrations, photography and most especially maps) should not merely function as appendixes to the text, but ought to have the capacity to inform the audience about specific spatial qualities. These spatial qualities can be related both to aesthetic and relational attributes between objects in space. Relational qualities may refer to distance, position, size accessibility, visibility and a number of other visual attributes. These attributes of objects in space could possibly be described through text (demanding an extraordinary capacity of visualisation from the reader and great narrative talent from the writer), but are more economically and adequately described through graphic conventions that involve measure and scale. In other words, image is instrumental in order to convey exact positions and spatial relationships, apart from spatial qualities that can be textually described, but not 'represented' in experiential terms. These observations would apply equally to the representational needs in other areas of design and show that the representation of spatial relationships resulting in an instrumental role for visualizations may be an indicator of potential for PbR. However, in urban planning and design, although images play a central role, they are not sufficient to convey a whole narrative. The context, the role and wishes of stakeholders, and the socio-political forces that ultimately produce real world space must also be described. Design seems to be quite ineffective as a means of conveying context, and describing societal forces. Both text and image are therefore necessary, with a discrete and necessary function for each.

The issues of form and content are strongly linked. Biggs and Büchler (2008: 14) emphasised that the novel form of much art and design research may distract from otherwise conventional content. Such cases would not be indicators of PbR but we do find in cases such as Research by Design, that various non-traditional forms are used to explore problems such as the social context of a project. The degree of subjectivity involved in non-textual tools of representation has been regarded as a barrier to their inclusion as relevant tools for research in spatial planning and design. However, it is possible to imagine both context and process being conveyed in non-conventional ways; including design, film, sound, virtually, etc. These possibilities should be explored because they are potentially rich in new input that cannot be obtained through textual analyses. This means that the analysis and explanation of context and process through non-textual tools might bring original and unexpected input to designers. TU Delft doctoral regulations (TU Delft 2004) require that projects be placed in a historical and critical context. We anticipate that the exploration of the problem, and indeed possible solutions, might be explored using non-traditional forms or media, whilst being contextualised using text and other traditional media, thereby meeting the need for content that can be examined for the degree.

The function of rhetoric as constituting the object through language, seems to be a challenge, and the observation that "language constrains the visual" (Biggs & Büchler 2008: 15) warrants further analysis. However, in urban planning and design, the constitution of the object through language seems to be the rule, perhaps owing to the need to meet the other definition of rhetoric: to be persuasive. Again, experiential tools for representation (installations, for instance, but also expressive drawing and other media) might lead to unforeseen results and new framings of the problem. We have in mind a visual issue both framed and resolved in the visual realm. Such an activity would represent a novel research paradigm, and constitutes the main part of our research on NtKC. At present we observe the claims of the visual designer for such a paradigm, and the scepticism of the text-dominated institutions. The

challenge is to find a voice that can speak to both. The potential outcome is the establishment of a non-textual research paradigm resulting in “multiple ways of knowing” (Eisner 1990: 91).

The issue of experience is embodied in different ways in different cases. All design activity presents its results via the senses, and to that extent experience is necessary for its appreciation. In some art forms, the first-person aesthetic experience is the central outcome: for example in the expressive arts. Even some design activity may be received in this way. What this issue is intended to foreground is the need for the apprehension of the physical object. Experience is therefore a key issue in all the creative and performing arts to the extent that they all mediate their subject matter via artefacts. There is therefore potential for PbR in all design areas except “conceptual arts”, and in urban planning the potential is in the representation of the project.

In the case of Research by Design at TU Delft, two of the four discipline-specific issues have concentrated on representation. We see this as a potential focus for PbR in exploiting the way design proposals are represented using physical media and artefacts. The case study also revealed the need to differentiate traditional from non-traditional content – the latter potentially indicating the operation of a novel research paradigm. Several of these issues have the probable accompaniment of textual and non-textual approaches, which should not be regarded as a weakening of the PbR potential. We conclude that Research by Design has particular PbR potential to address the issues of text & image; and form & content; and that novel forms of representation are most likely to reveal the opportunities that this non-traditional approach offers.

4 SUMMARY

The criterion-based approach, rather than embedding itself in a particular research paradigm, tries to stand outside the paradigm and identify features of something being research before it is identified as belonging to a particular paradigm. In this respect the criterion-based approach adopts a meta-position comparable to the common structure of research paradigms identified by Guba and Lincoln (2005). In the latter there are three persistent questions for which different worldviews provide different answers. Likewise the criterion-based approach poses persistent issues to which different paradigms provide different answers, even in the most extreme anti-Realist approaches. The four elements that we identified as being persistently indicative of something being a research activity were: the possession of a question and an answer, the presence of something corresponding to the term “knowledge”, a method that connected the answers in a meaningful way to the questions that were asked, and an audience for whom all this would have significance. A functional relationship between these four elements represents a functional connection of the worldview and the corresponding research paradigm. The audience has quite a strong role in our analysis because it determines the meaningfulness and significance of the question, and whether the actions that are taken actually generate something that is relevant for that community in response to the question. The audience is composed of the greater academic community as a whole, within which there resides a smaller, more specialized academic community that is in a situated position from which to judge the meaningfulness and significance of the research (Biggs & Büchler 2008: 11f.). We felt that these four elements were reasonably persistent, and were transferable to most subject areas. This is a development of other kinds of classification and criterion-building that have been attempted before, including the “CUDOS” system of Merton (1973), and others in the philosophy of science.

Our current research looks particularly at theories of worldview and research paradigms. In doing so we make reference to the work of Guba (1990), Guba and Lincoln (1994; 2005), and Heron & Reason (1997); and earlier work by Goodman (1978) and Kuhn (1996). The reason we focus on these theories is because we feel that the arts, as

newcomers to this academic context, are entering a context in which there are already some established worldviews and research paradigms derived from other more traditional academic subjects. It would be an interesting development if we could show that the arts bring with them a new worldview and research paradigm. Conversely, it would be nearly as interesting to see whether they could be happily fitted into existing worldviews and research paradigms.

This connection between the worldview and the research paradigm, between the belief set and the actions that are taken that correspond to that belief set, can be described as functional or dysfunctional. In well-established research paradigms such as the scientific method, hundreds of years of refinement have led to a very functional connection. But in newly academicized areas such as the arts we identified that there was a dysfunctional relationship between the actions that were being taken (the methodological question) and the beliefs that were being claimed (the ontological and epistemological questions). The case study of Research by Design at TU Delft attempts to find areas that could provide a functional relationship between worldview and research [PbR] paradigm.

REFERENCES

- BIGGS, M.A.R., 2003. The role of "the work" in research. Electronic publication. Bristol, UK: PARIP, University of Bristol. <http://www.bris.ac.uk/parip/biggs.htm> [accessed 1 November 2008].
- BIGGS, M.A.R. and BÜCHLER, D., 2007. Rigour and Practice-based Research. *Design Issues* 23(3) pp.62-69.
- BIGGS, M.A.R. and BÜCHLER, D., 2008. Eight Criteria for Practice-based Research in the Creative and Cultural Industries. *Art, Design and Communication in Higher Education*. 7(1) pp.5-18.
- EISNER, E., 1990. The Meaning of Alternative Paradigms for Practice, in: Guba, E. (ed.) *The Paradigm Dialog*. London, Sage, pp.88-102.
- GOODMAN, N., 1978. *Ways of Worldmaking*. Indianapolis, USA: Hackett Publishing.
- GUBA, E. (ed.), 1990. *The Paradigm Dialogue*. London: Sage Publications.
- GUBA, E. & LINCOLN, Y., 1994. Competing Paradigms in Qualitative Research, in: Denzin, N. & Y. Lincoln, *Handbook of Qualitative Research*. London: Sage, 105-117.
- GUBA, E. and LINCOLN, Y., 2005. Paradigmatic Controversies, Contradictions and Emerging Confluences, in: Denzin, N. and Lincoln, Y. *The Sage Handbook of Qualitative Research*. Third Edition. London: Sage, pp.191-215.
- HERON, J. and REASON, P., 1997. A participatory inquiry paradigm. *Qualitative Inquiry*. 3(3) pp.274-294.
- KUHN, T., [1962] 1996. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- MERTON, R., [1942] 1973. The Normative Structure of Science. In: *The Sociology of Science: theoretical and empirical investigations*. Chicago: University of Chicago Press, 267-278.
- RUST, C., MOTTRAM, J. and TILL, J. (2007). AHRC Research Review, Practice-Led Research in Art, Design and Architecture. London: AHRC. http://www.ahrc.ac.uk/About/Policy/Documents/Practice-Led_Review_Nov07.pdf [accessed 1 November 2008].
- TU DELFT, 2004. Doctorate Regulations (revised September 2008), Board for Doctorates, University of Delft. <http://www.tudelft.nl> [accessed 28 December 2008]
- UKCGE, 2001. *Research Training in the Creative & Performing Arts & Design*. London: UKCGE. http://www.ukce.ac.uk/Resources/UKCGE/Documents/PDF/CreativePerfromingArts_2001.pdf [accessed 1 November 2008].

ACKNOWLEDGEMENTS

The authors would like to acknowledge the support of the Arts and Humanities Research Council (UK) who are funding the Non-traditional Knowledge and Communication international research project at the University of Hertfordshire, UK.

Corresponding Authors Contact Information

¹Dr Roberto ROCCO
TU Delft
Bouwkunde/ Urbanism
P.O.Box 5043
2600 GA Delft
The Netherlands
r.rocco@bk.tudelft.nl
+31 015 278 1274
<http://bk.tudelft.nl/users/rocco/internet/index.html>

²Prof Michael BIGGS
University of Hertfordshire
College Lane
Hatfield
AL10 9AB
UK
m.a.biggs@herts.ac.uk
+44 1707 285341
<http://r2p.herts.ac.uk/biggs1.html>