Architectural Practice and Academic Research

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Abstract
This paper examines one possible relationship of academic research and professional practice. It notes that this issue arises from particular national conditions that are not necessarily shared in different countries. As a result, this relationship is not equally visible or similarly understood, and hence models of research have national and even regional variations that threaten the transferability of architectural research across national boundaries, in contrast to established models of research from the sciences. The paper proposes a criterion-based response to this problem that seeks to identify common features of research and practice, thereby extending previous scholarship on the nature of academic research.

Keywords
Architecture, research, academic, professional, criteria, international, fundamentals, norms

Introduction

This paper examines variations in the relationship of academic research and professional practice in different countries. It uses cases from architecture to illustrate a general thesis. It proposes a criterion-based response that identifies common essential features of research, thereby providing common ground for constructive debate.

Article

The first issue of the USA *Journal of Architectural Education* in 1947 offered a preview of the debate that still rages over the relationship of professional practice and academic research in architecture. In it Bannister adopted a broad view of research that included all kinds of information-gathering from both practical experimentation and experience, and from more scientific or laboratory-based approaches. His paradigm was the scientist-architect of earlier times. In the same issue Taylor called for ´research that was distinctly architectural´ and of the ´objective-fundamental type´.[1] What these articles shared was a lack of clarity about how research should be conducted in cultural and humanistic fields. In the intervening period there have been many international projects that have investigated the potential of what has become known as ´arts-based´ or ´practice-based´ research [PbR]: an integration of professional experiential knowledge-gathering and academic research. However, the conclusions of these projects are very different, and in part represent different national and cultural perceptions of the nature of the problem as well as its solution. What has emerged from the authors' experience on these projects is the need to go back to fundamentals before making claims regarding the benefits of PbR.[2] Such a fundamental approach would ask structural questions about the essential nature of research, and would result in criteria for identifying and evaluating research processes and outcomes, ensuring that research into PbR is comparable to scholarship about research in other areas, reflecting for example Merton's scientific norms[3]. This article examines the perception of the problem of design-related architectural research, and its use of terminology, in three different countries: Britain, Brazil and Sweden. It argues that these problems can be addressed by identifying a common set of criteria for research, based on the content of the scientific model rather than by imitating its form. As such this article adds to previous research by Merton, and Dunin-Woyseth & Michl[4], but is original in the details of its method and the criteria that it proposes in relation to PbR.

BRITAIN

In Britain, and more widely in Europe, there is an on-going debate about whether academic research in areas of design practice is different from the research that is developed in other disciplines[5]. The question of what constitutes research in the various areas was opened to discussion in 1992 when the British polytechnics were given university status and could therefore independently establish discipline-specific regulations that defined what constituted research in each area. With this change, certain criteria that were previously seen as clear and universal in most disciplines, started to be questioned and replaced by a search for definitions that would reflect the particularities of design practices such as architecture, fine, performing and applied arts, music, design, etc.[6] Formerly fixed and defined terms within the traditional model of academic research such as 'knowledge', 'creativity', 'reference', 'method', 'audience', etc, started to be questioned and explored. These concepts that are characteristic of the traditional model of research were reformed in an attempt to make them more applicable to the humanities. Some influential discussions were conducted around the hybrid concepts such as 'tacit and experiential knowledge', 'reflexive method' and 'grounded theory', and these still provoke considerable debate.[7] For example, tacit knowledge has been conceptualised by Polanyi in a way that allows it to be rigorously analysed[8], and has resulted in models of knowledge that are now used extensively in business and knowledge management, e.g. Mode-2 knowledge[9]. However, there are still criticisms of tacit knowledge and its philosophically subjective component[10]. Likewise, Schön's concept of knowledge-in-action has appealed to the design community[11] but is still criticised as an explanation of the transfer of action into knowledge[12].

This reformation occurred in a localized way in various British universities, each one responding to the demands made by their main audience (e.g. Universities of Coventry, Dundee, Hertfordshire, West of England, and the University of the Arts, London). At a national level the Research

Assessment Exercise (RAE), which assesses research quality, published a set of criteria for assessing the quality of research for the panel that deals with the areas of creative and design practice.[13] At an individual level some critics suggested that a separation between PbR and the traditional model of research in art and design should be made that corresponded to the identification of a specific route to the title ´PhD´ in areas of design practice in certain institutions.[14] Responding to published research by these individuals some institutions modified the traditional requirements for theses, demanding only the documentation of the design process[15]. Documentation of the process has been strongly adopted in the performance areas such as dance, where PARIP (Practice as Research in Performance) proposes that a dance performance is research.

As a result of this questioning of what would constitute research, many diverse and alternative concepts of quality and understanding have arisen. Today in Britain there are many models of PhD thesis that range from the traditional bound document to the possibility of submitting only a work of art or presenting an exhibit around which theoretical points are discussed at doctoral level.[16] The specific question of whether, in academic research in areas of design practice, there are issues that are fundamentally different from the dominant models of research should have been anticipated when the new British universities, the former polytechnics, restructured their syllabi. Within this new academic structure each discipline had its own academic research potential and it should have been possible to identify the gaps in the descriptions of academic research that would inevitably be developed independently in the departments that taught design practice. Because this situation was not anticipated by the British authorities, nationally accepted criteria of what constituted academic research in areas of design practice were not established and the subsequent confusion has now become institutionalized.

BRAZIL

In contrast to the British situation, the structure of higher education of architecture in Brazil divides those disciplines that deal with theoretical and fundamental issues from technical and productive aspects, and from design practice.[17] Perrone explored the bipolarity between research and architectural practice and claimed that expressions such as 'architectural project as thesis' *('projeto-tese')* were indicative of the problem for the Brazilian architect-researcher.[18] The architect-researcher archetype is the professional who designs, lectures and also develops academic research. However, the relationship between these activities is not clear. On the one hand, it is not clear whether the architect's practice contributes in an original and unique way to the academic research that she develops. On the other hand, the current structures within Brazilian academic production assume a distinction between the practical and research result. For example, in order to upload data onto the Lattes database of research, the output of design practice must be listed as technical rather than academic production.[19] This limits access to research funding because the professional who, as a result of this distinction, appears to have insufficient academic production will have to resort to other sources of financial support. As a result it is common to find that the professional develops research that presents a more practical outcome, or outcomes that have commercial applications. Such a professional, whose research is then being funded by non-academic research funding agencies, is disadvantaged in the development of theoretical and fundamental research which is the type of research that helps to build critical mass in an academic community.[20] Therefore, despite differences in their origination, in both Britain and Brazil the same question about the relationship between academic research and design practice is being asked: *Is academic research in areas of design practice in some way different from the dominant model of academic research?*

The Brazilian example provides an interesting comparison to the permissive approach to PbR in Britain. In Brazil, academic research and design practice are seen as two quite distinct activities. Therefore, although PbR outcomes exist in Brazil they are not in the foreground, and instead it is the differentiation between academic and practice production that is in the foreground for individual professionals.[21]

SWEDEN

In Sweden, one form of PbR is known as arts-based research. The Swedish government recently passed a Bill that broadened the scope of the Research Council [Vetenskapsrådet] to include the creative and performing arts. The 2005 Bill *Research for a Better Life* was the response to a three-year experimental period of ring-fenced funding in areas of national interest[22]. In 2006 this experimental period, which included four international visiting professors funded by Vetenskapsrådet, was itself the subject of a quality review[23]. The commissioning of this review shows the concern at a national level with the potential competitive advantage of establishing and exploiting a category of academic research in areas of design practice. Interestingly, architecture is included in these areas, unlike Britain where the research funding in PbR has mainly been in the fine and performing arts and design. The review also confirms the existence and foregrounding of PbR in Sweden. However, as distinct from the approach in Britain, the Swedish example suggests that this is an issue that could be investigated centrally with a view to a national definition and ultimate resolution of the problem, at least as far as the Swedish academy is concerned[24].

One example of the approach to PbR in Sweden is the Academy for Practice-based Research in Architecture and Design (AKAD). It is an architectural research network that has been established by the three national postgraduate architectural universities of Lund, Stockholm and Chalmers (Göteborg). A current project is ´Los Angeles Islands´ that investigates architectonic Americanisms in the Swedish region of Skåne. The project asks: ´What are the mechanisms at work in that which appears as a conglomerate of America-dreams? How are American utopias and dystopias - Los Angeles Islands - surfacing in south west Skåne? Los Angeles Islands is a project which by means of artistic interpretation aims at confronting the influences and expressions of American architecture in Sweden. The results are shown at exhibitions.´[25]

THE ILLUSIVE PROBLEM OF PRACTICE-BASED RESEARCH

It would seem that depending on how the matter is conceptualized, the distinction between PbR and conventional academic research can go from visible and debatable to invisible and therefore not debated. The authors of the present article take the view that PbR should not be set apart from traditional concepts of academic research. We argue that rather than being a distinct type of research that should be guided by special concepts, PbR is a subcategory of traditional academic research that can and should attend to and observe conventional research criteria. Some of these criteria may need to be rearticulated so that the terminology is recognized as meaningful to the areas of design practice. However, it is our belief that academic research communities would benefit from such clarification of the criteria that frame their discipline-specific methods and outcomes in more cross-disciplinary and transferable ways.

Perhaps because of national conditions such as those in our examples, the term PbR provokes a series of misunderstandings and disagreements. It is not clear, for example, what contribution from practice to academic research would characterize this research sub-group. If PbR is a subset of academic research then certain elements of academic research need to be reframed in a way that accounts for specificities of design practice, without losing their original purpose.[26] Even academic research that is developed within the traditional scientific disciplines contains practical elements such as experimentation, data collection, observation and interviewing. Maintaining the link between design research and traditional academic research is necessary because it will enable design to show that it conducts high quality, rigorous academic research.

At the Latin American Schools and Faculties of Architecture conference, Perrone discussed the question of academic research in the area of architectural design.[27] He stated that there is a concern in understanding the relationship between research and design, and presented two perspectives on academic research in areas of architectural design. The first perspective is apparent in debates that are conducted in the disciplines of architecture, design and urbanism where a large number of academics take research work as that which 'contains a method and/or a systematic treatment that is capable of establishing reflections and conclusions about some objects of study'.[28] The second perspective, which comes from the architectural design practitioners, defends 'design activities as research activities'.[29] The first group of academics argue that various other disciplines

can contribute to research on architectural design. On the other hand, the second group argue that because architectural design is the object of study of academic research in this area, it can only be known and therefore investigated effectively by the architect herself. If a researcher from a different area conducts the investigation, the risk is the same as when 'we try to conduct an economic interpretation without being economists, a sociological interpretation without being sociologists and so forth'.[30] Perrone concluded that this debate about the relationship between research and practice reflects the uncertainties about the production of knowledge that exist in higher education architectural institutes.

The contribution of design practice to academic research can best be described as a spectrum that is composed of two extreme poles with a long and variable range of possible combinations between the two. For the sake of perspicuity, three ways in which design practice can contribute to academic research will be described here: the two extreme poles of (1) exploratory practice within the traditional model of academic research and (2) practice as a generator of relevant questions that are explored within the structure provided by the traditional model of academic research; and (3) the problematic relationship that this study considers and that occupies the central position on the practice/research spectrum which claims that design practice *is* academic research.

The first relationship between design practice and academic research exists within the traditional, scientific model of academic research, where the role of practice is exploratory. At this pole hypotheses are created and ways of investigating these possibilities through experiments, models, interviews, representations, observations, etc., are considered. Within this model, design practice contributes to academic research as a means of testing the applicability of hypotheses and theories to real-world situations[31]. The other pole of the practice/research relationship exists within design practice. At this pole the practitioner surrounds herself during the creative process, with information that is deemed relevant for the specific design problem in the hopes of reaching an insightful solution[32]. Within this model, design practice is a means of identifying questions that are considered important to the applied context.

The problematic relationship between design practice and academic research appears when the original knowledge and understanding that results from design practice per se, claims to contribute to the advancement of that community, i.e. position (3) above. The definitions of academic research that are offered by research funding bodies highlight the contribution of the new knowledge to the community as being a defining characteristic of academic research.[33] It therefore seems to be a logical conclusion that design practice that contributes to the area in this way would be academic research. Design practice would therefore be the same as academic research and would mean, for example, that Lúcio Costa should have been awarded a PhD for the design of Brasilia, and Picasso for his *Demoiselles D'Avignon*. We believe this conclusion is erroneous.

We note two alternative arguments that explain the particular position that design practice occupies in academic research. The first claims that what distinguishes this particular research sub-group is the non-conformist education of the architect that makes her resist the systematization that is a necessary condition of academic research.[34] This argument classifies the area of design practice as distinct in some way. It also suggests that academic research that is developed in these areas should enjoy special privileges because of its distinctiveness. The second argument suggests the opposite opinion: that these areas are not different from the other disciplines where academic research is conducted and for that reason, if the design practitioners require different criteria (such as the architectural project as thesis) they need to make a persuasive argument that defends the use of alternative conceptualizations rather than simply suspending the established criteria.[35] This argument suggests that academic research in areas of design practice would be different but equal.

We propose that these only appear to be different arguments, and that by achieving transparency about the meaning and use of terminology, many of these apparent differences will disappear and the positions can then be reconciled. We claim that academic research-defining criteria should be analysed so that the conceptual essence of these criteria can be reconsidered in light of the particularities of design practice. To achieve this it is necessary to take relevant concepts that are accepted by the design practice community into consideration when reframing more inclusive academic

research criteria. The simple and wholesale acceptance of practice as research creates problems. One aspect that makes the recognition of this type of research as academic production potentially problematic is the non-traditional nature of its results. This makes them incommensurable with traditional written documentation. Another problem is the specificity of the many concepts that are used in design practice. This goes against the notion of generalizability, or at least transferability, of research.

There are emerging discipline-specific interpretations of concepts such as 'knowledge', 'rigor' and 'artefact' in areas of design practice, to name a few. Notions of 'knowledge' in its various forms and manifestations have been discussed by the Research Training Initiative, the Non-Traditional Knowledge and Communication Project, and in the second Research into Practice conference in 2002.[36] However, there is also a huge variety of self-professed practice-based PhDs and doctoral supervisors with limited experience of research. Even in Britain where PbR has long been recognized, there is still considerable disagreement about what constitutes indicators of excellence in academic research in general. Evidence of this situation can be seen in the various debates on academic discussion lists.[37] Without a shared definition of criteria, the question of PbR is circular. For example, the statistical data on PbR PhDs does not give an account of whether or not these PhDs respond to a group of expanded criteria that is compatible with, and comparable to, those held in traditional models of academic research.[38]

A METHOD FOR BREAKING THE VICIOUS CIRCLE

In response to the above we oppose the notion that PbR is a sub-group of academic research that is somehow different from research conducted in other areas, requiring special treatment. In order to substantiate our position we propose a criterion-based approach that analyzes the necessary content of terms such as ´knowledge´, ´rigor´, and ´artefact´ so that any differences between the content in one area and the content in another can be exposed. The analysis is undertaken from a theoretical position that reveals the necessary and sufficient conditions for each criterion, and that prevents the analysis becoming a vicious circle. If criteria are developed from actual case studies it is difficult to subsequently use the criteria as defining characteristics of research because they are influenced by the case studies which could not have been filtered without using the criteria, hence the circularity. The criterion-based approach verifies whether incorporating discipline-specific interpretations that are held by this sub-group will bring any advantages to the academic community, or whether it will merely dilute rigorous academic research. We believe it is essential that research in this area be recognized as rigorous and comparable to research in other fields in order to gain credibility. There is, however, still the problem that research which is recognized as academic is that which meets the traditional norms of research. This difficulty can be resolved if the traditional norms of research are analysed using a criterion-based approach so that what is essential is differentiated from what has come to be expected owing to historical precedent. For example, is there a fundamental reason why research is normally reported in written format, or is that just a precedent derived from text-based disciplines?

In 1997, the United Kingdom Council for Graduate Education (UKCGE) commissioned a report on PbR, which presented a strong and welcome argument for the relevance of studying PbR as a means of improving the academic industry's competitive advantage. The report identified three main principles of doctoral research: 'contribution to knowledge and understanding', 'critical knowledge of the research methods' and '[be] subject to an oral examination by appropriate assessors'.[39] This attempt to find a few fundamental principles that underpin academic research in all subjects is evidence of a move towards criterion-finding as means of resolving the present confusion.

This analysis fits the re-evaluation of the aim of the PhD in Britain that was done as a consequence of the expansion of university interests into non-traditional areas such as art and design. The re-evaluation aimed to differentiate the fundamental content of research from the format in which it was being delivered, i.e. the textual thesis. The analysis aimed to facilitate the identification of qualities that could be demonstrated in a non-textual or practice-based way. As a result, many contentious areas were identified and the conclusion that was reached was that:

What is needed is a set of nationally agreed definitions of standards for the award of doctorates... framed in such a way that they are sufficiently rigorous to secure demonstration of the qualities outlined at 3.2 above, but sufficiently inclusive to allow all subjects to find expression within them.[40]

The UKCGE report also identified how this could be accomplished:

This inclusive model would involve either demonstrating/accepting that the activities and outcomes outlined in earlier sections could reasonably be seen as consistent with a traditional scientific model, or broadening the model so as to encompass the entire continuum from scientific to practice-based research. This would entail re-defining the former in general terms of, for instance, the acquisition of relevant data, the exercise of critical and analytical skills, sustained and coherent argumentation, and clarity and (relative) permanence in presentation, rather than in the narrower terms of formation and testing of hypotheses. Such shifts, which have occurred already in the system across all manner of disciplines, perhaps need to be formally acknowledged and embraced. It would follow from this approach that the creative process involved in practice-based doctorates can be seen as a form of research in its own right and, as such, as equivalent to scientific research. Thus, the product and associated creative process presented as part of the doctoral submission can be viewed as demonstrating the defining competences of doctorateness in the 'same way' as in a traditional research based submission.[41]

This recommendation suggests that there would be a benefit in studying PbR. However this benefit would not be to create a sub-group but rather to create a complementary approach to scientific research. The report also highlighted that there is a large number of projects in the humanities that, strictly speaking, do not fit the traditional and/or scientific model of research. These studies are being developed in various areas of the humanities and not only in areas of the design practice, and are moving in the direction of the model that is proposed for PbR. Solving the PbR problem therefore has ramifications well beyond design practice.

We therefore infer that the systematic analysis of concepts from the traditional model of academic research in order to rebuild a model of research that is more in line with the needs of the areas of design practice, is a worthwhile pursuit. Structuring of such a model would also increase the competitive advantage of the academic community.

AN EXAMPLE OF THE CRITERION-BASED APPROACH

The criterion-based approach generates not just individual characteristics of research, but an interlocking network of concepts that are mutually dependent and together form an adequate model for research in all disciplines: a unified theory. The resulting account can be evaluated in terms of coherence. There are a number of core concepts around which such an account might be constructed, and in this paper we have chosen to focus on the roles of dissemination, originality, and the audience in the judgment of whether a work is research. It is our claim that the judgment and classification of a work as research is a judgment that is made by the audience and is an issue of its reception, rather than being determined by the intention of the ´author´. This is because a work must meet a few basic conditions in order to function as research, and these are centred on issues of communication and audience. While the researcher must purposefully position the work, its reception depends upon it meeting these conditions in the opinion of peers. At this stage of our study we propose that there are three fundamental criteria that constitute three necessary and sufficient conditions for a work to be research. Furthermore, we contrast them with one often-cited condition that appears to be unnecessary: authorial intention. The necessary and sufficient conditions are dissemination, originality and context. Other requirements such as the identification of an explicit research question are regarded as consequences of these conditions.

Research must be disseminated because it must influence the actions of other practitioners in the field. This is what is meant by advancing knowledge or its interpretation. An advance is made by one researcher and disseminated to others so that they benefit from that person's work. Accounting for his accomplishments Newton said: ´If I have seen further it is by standing on ye shoulders of Giants.´.[42] The opposite condition to dissemination would be a field in which everyone originated knowledge for themselves, which would involve everyone ´reinventing the wheel´. While this would be high in originality in the sense of lots of origination (cf. next condition), it would be low in effecti-

veness. Research is a process that should make knowledge generation more efficient. By sharing knowledge about the invention of wheels or their uses, we allow the creative energies of co-researchers to be applied to more advanced topics. Research is a cumulative process even if one rejects the [Modernist] notion of it being progressive.

There are some other inferences that can be drawn from this necessity to disseminate research that involves communicating with the audience for research. While there is no guarantee that the audience will see and understand the research, it is clearly more probable that the research will impact on the audience if it is communicated through an effective channel. This is why high impact journals are regarded more highly than low impact journals: because of the increased probability of research published in high impact journals reaching the intended audience. The same applies to exhibitions. If we put to one side the question of what role artefacts have in research, we can see that if artefacts have a role in research, then disseminating them through high profile venues such as Tate Modern will be more likely to reach the intended audience than dissemination through low profile venues such as the local library. The intended audience is firstly the community of researchers in the field, because by sharing knowledge and its interpretation with them we can maximize the development of the field by diverting energies away from reinventing wheels. The audience also includes other practicing professionals, the interested public, etc.

The second of the necessary and sufficient conditions is originality. Research must result in something original that was not known or interpreted in this way before. This knowledge must be new for the audience and not just new for the researcher. Although it is common to use the term ´research´ to describe what undergraduates do when they visit exhibitions or go to the library in order to find out about a subject, research in the academic context means making a claim to new knowledge or interpretation that nobody has hitherto known. We describe this difference as that between trivial originality and consequential originality.

Several inferences can be drawn from this. It is part of the task of the researcher to demonstrate that this knowledge is new. This is undertaken by what is known in doctoral studies as the literature search, which of course includes searching all kinds of media appropriate to the subject. If this is done thoroughly and systematically it is possible to undertake a gap analysis with which one can substantiate the claim that the knowledge or interpretation in the research has not been claimed by anyone previously. This is the definition of originality. Of course, this process cannot account for knowledge that is known by somebody but is not made public. This returns us to the duty of dissemination. Knowledge that is held by one person and not disseminated is not recognized by anybody else and if somebody else publishes this knowledge the attribution of intellectual property goes to the researcher who makes the first public claim to the knowledge rather than to the one who first thought it. This, famously, was the problem between Newton and Leibniz over who originated the idea of the calculus.

The third condition is context. Research must be contextualised because by placing the outcome in a critical context the researcher not only contributes to the argument in defence of originality but also makes clear the way in which the knowledge develops or departs from existing modes of understanding. This explains the use of the knowledge: the interpretation of what has been claimed. Other researchers may find alternative uses or interpretations of the knowledge and this would constitute new claims to originality.

Whether a work is a work of research is therefore a judgment about whether it meets these three conditions. But one question is: a judgment by whom? To what extent is research produced by an intentional act on the part of the researcher, and to what extent is work received by an audience who understands it and recognizes its original contribution, and who therefore should change their actions in response to it?

For appropriate reception by the audience, it has been said that the work must be disseminated. Dissemination means not only putting the work out into the world, but also doing so in a targeted way, so that it has a high probability of reaching an audience for whom this contribution will be consequential. So dissemination already ties the researcher to the audience by assuming that they

share the communication channel through which the work is disseminated, e.g. the journal or the exhibition. To some extent we can see that for this to be effective there needs to be intentionality on the part of the researcher.

We can also attribute intentionality to the audience, especially if the communication channel is labelled as a research channel, e.g. a research journal or a research exhibition. This suggests that the audience is open to being impacted by new knowledge. Hence the audience is potentially different from the audience for art-as-culture, design-as-consumption, music-as-recreation, architecture-as-habitation, etc. We have already seen that originality can be problematic. Originality is not solely novelty, but something that is a new and consequential development not just for the researcher but also for the audience. Originality needs to be recognized for its novelty and for its consequentiality. Originality is therefore closely linked to the third condition of contextualisation. The audience will only recognize the novelty of the work if they are familiar with, or presented with, a context in which its novelty becomes apparent. For originality to be recognized above and beyond novelty for the experiencing individual, requires an experienced individual. This role is often given to the critic who is professionally exposed to a greater number of works than most other members of the audience, and we may defer the confirmation of originality to the critical reviewer. The consequences of the originality, i.e. the consequences that we see in research, need to be unpacked by the researcher. This involves both the linkage to previous work, the gap analysis of previous work, and the argument for the benefits and consequences and impact of the present work. This argument is purposefully put forward by the researcher, and it is a matter of the critical response of the audience whether this argument is accepted as valid.

In meeting these three necessary conditions there is clearly an intention required on the part of the researcher: the intention to disseminate, the intention to claim consequential originality, and the intention to contextualize and argue for that claim. Thus we can conclude that intention is desirable on the part of the researcher in order to claim a work as research. But this intention is matter of positioning. These actions are prerequisites for the judgments that constitute the classification of the work as research. It is the audience who makes the judgment as to whether these arguments and claims have been successful and therefore the researcher's intention is an unnecessary condition of that judgment. It is the audience that contains the practitioners and co-workers in the field whose practice will be impacted by the work if it is received as both original and consequential. It is the audience who will refer to the work and attribute intellectual ownership of the ideas to the researcher. On this basis we can see that the judgment of the audience is more important in the classification of a work as research than the mere intentions of the researcher. Indeed, if the researcher does not intend to present the work as research it may nonetheless be received as such. For example, although Picasso denied that his work was research, this would not preclude subsequent generations evaluating his contribution as a research contribution.

CONCLUSION

We claim that the criterion-based approach to what constitutes design-related research in architecture is productive. We have shown, for example, that it is possible to conduct a theoretical analysis of the needs of the research community and from that analysis to extract at least three necessary and sufficient conditions that must underpin research in any discipline. These resulting criteria can be used to test whether an example of PbR constitutes research or not. The method also avoids the circularity of previous approaches to this problem. Such an approach provides grounds for the judgments about inclusion or exclusion of particular approaches formerly based on authorial preference or appeals to tradition or practice. We believe these appeals are no longer sufficient to deal with the problems facing architectural research, and in particular the understanding and evaluation of the relationship of academic research to professional practice. Our current research continues to develop and refine these criteria.

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NOTES

[1] Taylor, W.A. ´The Architect Looks at Research´ *JAE* **1** (1947): p.15.

[2] The authors coordinate an international collaborative research project entitled ´academic research in areas of design practice´, details of which are available online at http://www.herts.ac.uk/artdes1/research/tvad/ar-dp.html

[3] Merton identified 4 norms of scientific research: Communalism, Universalism, Disinterestedness, and Organised Scepticism, known by the acronym CUDOS. Merton, R. *The Normative Structure of Science*, 1942. However, these norms might be more recognizable in the creative and cultural industries if considered in the context of qualitative research, e.g. ´transferability´ and ´generalizability´ instead of ´Universalism´, cf. Lincoln and Guba ´The Only Generalization is: there is no Generalization´ in: Gomm, Hammersley and Foster *Case Study Method.* London: Sage, 2000, pp.27-44.´

[4] H. Dunin-Woyseth and J. Michl ´Towards a Disciplinary Identity of the Making Professions´. Available online at URL http://www.geocities.com/Athens/2360/english-only.htm [accessed March 2008].

[5] e.g. Knowles, J. and A. Cole, *Handbook of the Arts in Qualitative Research*. London: Sage, 2008

[6] cf. Council for National Academic Awards [CNAA] *Handbook 1996.*

[7] ´Tacit and experiential knowledge´ are terms that have gained currency in business studies, cf. Polanyi, M. *The Tacit Dimension* (New York: Doubleday, 1966). In education the concept of ´reflexive method´ is influential, cf. Schön, D.A. *The Reflective Practitioner: How Professionals Think in Action* (London: Arena, 1991). ´Grounded theory´ is influential in the social sciences, e.g. Strauss, A., & J. Corbin. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques* (London: Sage Publications, 1990).

[8] e.g. Nelson R.R. and S.G. Winter, *An Evolutionary Theory of Economic Change*. Cambridge MA: Bellnap, 1982.

[9] Gibbons, M., H. Nowotny, et al. *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies.* London: Sage Publications, 1994.

[10] e.g. Foray, D., P. David, and R. Cowan. 'The Explicit Economics of Codification' *Industrial and Corporate Change,* 9 (2), (2000) pp.211-253.

[11] e.g. Cross, N., ´Forty Years of Design Research´ *Design Studies* 28 (1) (2007) pp.1-4.

[12] e.g. Fendler, L. ´Teacher Reflection in a Hall of Mirrors: Historical Influences and Political Reverberations´ *Educational Researcher* **32** (3) (2003) pp.16-25.

[13] The RAE is a quinquenial quality review of research in British Universities that forms the basis of the allocation of government funding. The criteria for determining the quality rating for the forthcoming 2008 exercise can be found in *Panel Criteria and Working Methods: Panel O* (London: HEFCE, 2006). When evaluating the research that is produced in various areas, the RAE panels give grades that go from 1* (one star) to 4* (four star). However, the qualitative distinction between these grades is not considered to be clear, especially between 2* and 3* which are respectively described as research that demonstrates ´Quality that is internationally excellent in terms of originality, significance and rigor but which nonetheless falls short of the highest standards of excellence´; and ´Quality that is recognized internationally in terms of originality, significance and rigor´.

[14] e.g. Scrivener, S. ´The Practical Implications of Applying a Theory of Practice Based Research: a Case Study´ *Working Papers in Art And Design* **3** (2004) [unpaginated electronic journal]. URL http://www.herts.ac.uk/artdes1/research/papers/wpades/vol3/ssfull.html [accessed April 2007]. Universities that have adopted specific PbR doctoral routes include Coventry, Dundee, and Oxford Brookes.

[15] e.g. Kent Institute

[16] Practice-Based Doctorates in the Creative and Performing Arts and Design (London: UKCGE, 1997.) §5.3.

[17] At the Faculty of Architecture and Urbanism of the University of São Paulo this division is reflected in the departmental names: Department of Architectural and Design Aesthetics History (AUH), Department of Architectural Technology (AUT) and Department of Architectural Project Design (AUP). In the case of the AUH and AUT departments, there is a direct connection between the content of the graduate modules and the research that is conducted in each department. For example, research that is conducted in AUH can make a critical analysis of an architectural work and in AUT it is possible to evaluate buildings, materials and production processes. It is common that research that is developed in the AUP department adopts the same methods or investigates the same questions as the other two departments. It is therefore difficult to consider the contribution of the design activity to research or issues that are relevant to that practice through the use of these conventional methods.

[18] Perrone, R.A.C. ´A Pesquisa em Projeto e o Projeto como Pesquisa´ *Apresentações/Ponências do XIX CLEFA.* (São Paulo: UPM/UDEFAL/UDUAL, 2001), pp.255-257.

[19] Lattes is the Brazilian national database of research institutions and individuals. URL http://lattes.cnpq.br/index.htm [accessed April 2007].
[20] Friedman, K. ´Art, Design and Research: the New Challenges of the Making Disciplines.´ Refsum, G. and P. Butenschøn (eds.) *Kunsthøgskolen i Oslo Årsbok 2004* (Oslo: National College of the Arts, 2004), pp.199-214.
[21] Biggs, M.A.R. and D. Büchler. ´Rigour and Practice-based Research.´ *Design Issues* **23** (3) pp.62-69
[22] Vetenskapsrådet ´Review of the Year 2005-2006´
[23] Michael Biggs, was one of these visiting professors, assisted by Daniela Büchler.
[24] e.g. the recommendations in *Evaluation of Swedish Architectural Research 1995–2005,* Stockholm: FORMAS, 2006, p.21
[25] AKAD http://www.akad.se/losang.htm
[26] Biggs, M.A.R. and D. Büchler. ´Rigour and Practice-based Research.´ *Design Issues* **23** (3) pp.62-69
[27] Perrone, R.A.C. ´A Pesquisa em Projeto e o Projeto como Pesquisa´ *Apresentações/Ponências do XIX CLEFA*. (São Paulo: UPM/UDEFAL/UDUAL, 2001), pp.255-257.
[28] The original text is in Portuguese: ´possuam um método e/ou um tratamento sistemáticos capazes de estabelecer reflexões ou conclusões acerca de alguns objetos de estudo´ Ibid: p.255.
[29] The original text is in Portuguese: ´as atividades de projeto como atividades de pesquisa´ Ibid: p.255
[30] The original text is in Portuguese: ´tentamos fazer uma interpretação econômica sem sermos economistas, tentamos fazer uma interpretação sociológica, sem sermos sociólogos, e assim por diante.´ Sanovicz, A.V. 1990. ´A Pesquisa na Área de Projeto.´ *Natureza e Prioridades.* (Anais mimeografados do seminário Natureza e Prioridades da Pesquisa em Arquitetura e Urbanismo FAUUSP, 1990), p.111.
[31] This approach is epitomised by the 'first generation design methods' in the 1960s according to Bayazit in: Bayazit, N. 'Investigating Design: A Review of Forty Years of Design Research' Design Issues 20 (1) pp.16-29.
[32] Nigel Cross describes this pole by finding three locations of design knowledge: people, processes and products, in: Cross, N. 'Design Research: A Disciplined Conversation' *Design Issues* **15** (2) pp.5-10
[33] e.g. the Arts and Humanities Research Council [AHRC], Research Assessment Exercise [RAE], Economic and Social Research Council [ESRC], etc.
[34] Perrone, R.A.C. ´A Pesquisa em Projeto e o Projeto como Pesquisa´ *Apresentações/Ponências do XIX CLEFA.* (São Paulo: UPM/UDEFAL/UDUAL, 2001), pp.255-257.
[35] Biggs, M.A.R.. ´On Method: The Problem of Objectivity´ Durling, D. and K. Friedman (eds.) *Doctoral Education in Design: Foundations for the Future* (Stoke-on-Trent, UK: Staffordshire University Press, 2000), pp.209-214.
[36] The Research Training Initiative has published a range of online resources. The project was initiated by Darren Newbury who specifically addressed the issue of knowledge in his paper ´Knowledge and Research in Art and Design.´ *Design Studies* **17** (2) pp.215-219. The Non-Traditional Knowledge and Communication Project is hosted by the University of Hertfordshire. The project website may be found at http://sitem.herts.ac.uk/artdes_research/tvad/ntkc.html. Research into Practice is a biennial international conference whose proceedings from 2002 are published in the electronic journal *Working Papers in Art and Design* **2**. http://www.herts.ac.uk/artdes1/research/papers/wpades/vol2 [accessed April 2007].
[37] e.g. PhD Design (PHD-DESIGN@jiscmail.ac.uk) and Practice-led research (AHRC-PL-REVIEW@jiscmail.ac.uk) accessible via http://www.jiscmail.ac.uk
[38] For example, a recent study was undertaken for the AHRC that generated a database of PbR PhD theses, but the exact criteria for differentiating PbR from traditional research is not clearly set out.
[39] Practice-Based Doctorates in the Creative and Performing Arts and Design (London: UKCGE, 1997), §2.2.
[40] Ibid: §4.3.
[41] Ibid: §4.4.
[42] Newton to Hooke, 5 Feb. 1676