Reviewing the Understanding & Use of Experiential Knowledge in Research

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Abstract

This paper presents a review of current literature and developments in art & design research in the UK with regard to the understanding and use of experiential knowledge. It is further complemented by literature from other countries as well as from other practice-led disciplines. The review shows that there are some initiatives which have explicitly aimed to promote the understanding of knowledge in art & design research, but that there has been no systematic and comprehensive review of knowledge in research so far. In due course, this review provides a first overview over the indicated territory including an analysis of UK research regulations and requirements with regard to knowledge as well as a broad analysis of the understanding of knowledge by researchers in the field. In the conclusion, central problems identified in the review are summarised and presented for future investigation.

1) Introduction

This paper presents a review of existing literature that is concerned with the understanding of experiential knowledge in the context of research in art & design and other practice-led disciplines in the UK. The review has been conducted as part of the Experiential Knowledge Project (EKP 2006) which is concerned with understanding the nature and role of knowledge in research and practice in order to clarify fundamental principles and practices of research in practice-led disciplines. The purpose of the review is to establish whether a systematic and comprehensive study has been done of the role of experiential knowledge in research in art & design. The further purpose was to draw out what the relevant issues and problems are in the relationship of knowledge, research and practice, and in the understanding of each, in order to present them for further investigation.

Our motive for the inquiry into the nature and role of experiential knowledge in research has evolved from the numerous debates in the UK concerning the use of creative practice *within* research and (arguably) *as* research (Biggs 2002b; Durling, Friedman et al. 2002). These debates have raised questions about the form and nature of knowledge relevant to art & design, and about what we mean by a 'contribution to knowledge'. For a better understanding of why the aim of using creative practice *within/as* research has arisen and of its consequences, it is worth considering briefly what may have contributed to its emergence.

Perhaps one of the initial causes for the emergence of the aim of practitioners to use creative practice within/as research may be a political problem, which has been created e.g. through the introduction of the Research Assessment Exercise (RAE) in the UK in the 1990's (Durling 2002; Niedderer 2005). The RAE as well as other funding bodies for research provide financial support and recognition of research in the academy, resulting for example in the allocation of funding and time to individual research-active staff for their research. Because the same recognition is not available for practice in the academy, many practitioners are motivated, or required, to present their (creative) work as research to gain the same support for their work. The logic behind such an arrangement, which funds research but not practice, may originate in the consideration that the results of research are meant to be shared to the benefit of the community while practice is seen as a commercial activity with financial benefits for the individual rather than the community. What this consideration does not take account of is that there are practitioners in the academy that pursue their practice less for a commercial benefit than out of the aim to advance their field, which may be perceived to parallel the aims of research.

Under the influence of practitioners striving for the same recognition and benefits that conventional research receives while continuing their investigative practice, over the last decade, the aim to use practice within research has emerged and has been institutionalised under various names such as practice-based, practice-led, or studio-based research. From the perspective presented above, this emergence may be seen as being controversial because it appears as a reaction to system requirements rather than as an intrinsic necessity of research in art & design, and because it has contributed to confusions about research and practice. However, the debates also show that there is a perception of the need for the use of creative practice within research in order to generate knowledge relevant to art & design practice and thus to make research in art and design more relevant to professional practitioners (Green and Powell 2005: 100). This perception is rooted in the understanding that practice-led disciplines draw on a multiplicity of different kinds and formats of knowledge, including experiential or tacit knowledge, while research currently prioritises explicit (propositional) knowledge due to requirements such as the unambiguous communication of knowledge.

The problem of the nature and contribution of knowledge can be illustrated as follows: Both researchers and practitioners claim to advance their respective fields. However, researchers claim to advance the field through the creation of original knowledge, while practitioners claim to advance the field through their practice, i.e. through the creation of new products (include. artefacts, performances, services, systems, etc.). If this is so, it seems that both, new products and new knowledge, must have a close relationship, e.g. that knowledge informs new products, and that new products inform the creation of new knowledge. This raises the question about the contribution of practice to the creation of knowledge in the context of research, and vice versa. The problem seems to be the disparity between the nature of the knowledge generated by research, i.e. propositional/cognitive/explicit knowledge due to the research requirement for the communicability of knowledge, and the nature of knowledge relied on, and generated by practice which is largely experiential/tacit (Higgs and Titchen 1995; Eraut 2003; Niedderer 2005). To establish an understanding of the relationship of experiential and cognitive knowledge in research and practice in turn seems to be key to answering these issues and questions.

While the Experiential Knowledge Project may not be able to solve the political aspects of the problem at stake, instead it aims to address and clarify the scholarly problems of the nature and contribution of knowledge as well as of possible forms of its embodiment and communication relevant to art & design. In this way, EKP aims to make a contribution to clarifying questions about the relationship of research and practice, about differences in knowledge within research and practice, and about the role of practice in the creation and communication of knowledge in the context of research. The literature review presented with this paper is the first part of our research on experiential knowledge.

The review begins by examining how research regulations reflect and deal with the problem of knowledge, because this is where the problem of knowledge has mainly become manifest and institutionalised. The discussion of research requirements of the Research Assessment Exercise (RAE), of funding agencies such as the AHRC as well as of university regulations serves to show how these bodies deal with the problem in formal terms, where there might be insufficiencies, and what further developments are on the way. Against this backdrop, it is considered what the main issues are and how the research community has dealt informally with this problem so far by proceeding to review literature on the problem of experiential and cognitive knowledge from art and design, and subsequently from related practice-led disciplines.

2) Reviewing Literature from Art & Design: Regulations & Knowledge

The review of the research definitions of AHRC and RAE shows that these funding bodies have responded to the challenge of using creative practice within research by formally allowing the inclusion of the processes and/or products of creative practice or consultancy work into research

submissions. However at the same time the definitions aim to demarcate the difference between research and practice. For example, AHRC regulations (AHRC 2005) state that

> This definition of research provides a distinction between research and practice *per se*. Creative output can be produced, or practice undertaken, as an integral part of a research process […] The Council would expect, however, this practice to be accompanied by some form of documentation of the research process, as well as some form of textual analysis or explanation to support its position and to demonstrate critical reflection. Equally, creativity or practice may involve no such process at all, in which case they would be ineligible for funding from the Council.

The definition of research for the RAE 2008 (RAE 2005) explains that

> 'Research' for the purpose of the RAE is to be understood as original investigation undertaken in order to gain knowledge and understanding. It includes work of direct relevance to the needs of commerce, industry, **and** to the public and voluntary sectors; scholarship*; the invention and generation of ideas, images, performances, artefacts including design, where these lead to new or substantially improved insights; and the use of existing knowledge in experimental development to produce new or substantially improved materials, devices, products and processes, including design and construction. It excludes routine testing and **routine** analysis of materials, components and processes **such as** for the maintenance of national standards, as distinct from the development of new analytical techniques. It also excludes the development of teaching materials that do not embody original research.
>
> * Scholarship for the RAE is defined as the creation, development and maintenance of the intellectual infrastructure of subjects and disciplines, in forms such as dictionaries, scholarly editions, catalogues and contributions to major research databases.

Both definitions describe in general terms in which cases the inclusion of practice (i.e. of creative process or output) is eligible, and in which it is not. These descriptions differ and may appear at times controversial (Niedderer, Biggs et al. forthcoming 2006: introduction). For example, the RAE definition excludes practice that is routine, but permits practice where it contributes to gaining new/improved/original knowledge or understanding, which may pertain both to the generation of knew knowledge as well as the application of existing knowledge in new situations. In turn, the AHRC definition emphasises on explicatory documentation of practice for it to be recognised as research. (The requirements for explicating research questions/problem, context, and methods are set out in more detail in the first part of the AHRC definition and are discussed in a paper by Biggs 2002c). Tacitly implied in the AHRC definition is that the documentation has the purpose of explicating the original contribution to knowledge that is named in the RAE definition. Further, the requirement of the AHRC definition for textual analysis/documentation seems to indicate that the contribution to knowledge can (only) be communicated by textual means. However, this leaves the role of the creative process/output within the process and communication of research largely undefined. Also, both definitions remain silent about what knowledge and understanding means in the context of their specifications, about where and how this knowledge is contained (e.g. in the creative output, the textual parts, or both?), as well as about how this knowledge is communicated by either/both textual or creative output.

One finds a similar lack of clarity in regulations for PhDs. In their review of *Doctoral Study in Contemporary Higher Education*, Green and Powell devote one chapter of the book to the discussion of the nature and purpose of practice-based doctorates (Green and Powell 2005: 100-118). For the purpose of their discussion

> 'practice-based' is being interpreted as practice linked to the creative arts and involving a contribution to knowledge through practice. (101)

Green and Powell report that 50% of the 90 universities, which have responded to a survey call for the UKCGE report 1997, offer explicit rules for practice-based research degrees. They explain that, similar to AHRC requirements, most of these university regulations permit submission of creative products in conjunction with a written piece (thesis, exegesis) of variable length for a

research degree. The problem with this requirement is that while it specifies the formal relationship of practical and written work, it remains silent about the intrinsic relationship of the two, i.e. about how the two parts relate with regard to the embodiment and communication of knowledge.

Green and Powell recognise the dilemma that this lack of specification creates for the understanding of practice-based PhDs and consequently for the conduct within pursuing such a degree. In order to approach the problem, they discuss context, category and nomenclature of practice-based PhDs as well as what constitutes the basis for the award of a practice-based doctorate and the relationship between creative works, design and research. Within the discussion, they point out that there is as yet no national consensus about the regulations and conduct for practice-based doctorates (103). Besides the most common practice of submitting creative work together with a thesis, the debate is still ongoing (as manifest in some Universities' regulations) as to whether

> a Practice-Based Doctorate can be awarded solely on the basis of the production of creative work(s) – assessed by knowledgeable peers who are experienced in the field and who can therefore pass judgement on whether or not the work(s) is worthy of note as excellent in respect of the criteria operating in that field and as contributing to knowledge itself. (103)

Whether or not the creative work submitted for a practice-based doctorate has to be of professional excellence may be arguable, but it seems to be commonly accepted by now that the original contribution to knowledge is an essential criterion for awarding a PhD, including a practice-based doctorate. However, it remains unresolved in which format this knowledge is to be presented. This leads back to the problematic about the embodiment and communication of knowledge that allows the knowledge contribution to be recognisable. For example, is the knowledge inherent in the experience of the creative work, and is therefore the advance of knowledge built on the skills of the candidate and the ability of reception by an informed audience? Or is the knowledge contained in the (verbal) explication that accompanies the work thus justifying the primacy of language for the communication of knowledge (104)? Some of these questions have been approached e.g. in writings by Scrivener (2002b) and Biggs (2002c), which are discussed in section §4.

Going one step further, the questions about the embodiment and communication of knowledge may have their foundation in another problem which Green and Powell only mention in passing. When they consider that "the PhD is a generic award made for a contribution to knowledge", they add casually that this is the case "whatever the nature of that knowledge" (Green and Powell 2005: 101) without considering the significance of this statement for the remainder of their discussion. This statement importantly implies that there may be different kinds of knowledge, which will have significant consequences for the embodiment and communication of the contribution to knowledge.

In summary, section §2 has provided a brief overview over UK research regulations and requirements concerning the understanding of knowledge in relation to research and the use of practice within research. The main insight from the above review of research regulations is that the issue of the nature, embodiment, and communication of the contribution to knowledge as regards experiential knowledge has not been addressed in this literature, because the understanding of the concept of knowledge is presupposed and not differentiated. The review has further indicated that the role and understanding of knowledge carries a pivotal role for the understanding of art & design research, particularly for the conduct of research concerning the inclusion of practice, and also for the relationship of research and practice. The following part of the review (§3) examines in due course how researchers deal with the concept of (experiential) knowledge in their research, and also with the understanding of its embodiment and communication.

3) Reviewing the understanding of knowledge in past and current research developments

This part serves to provide an overview and discussion of the understanding of knowledge in past and current research developments in art and design and related practice-led disciplines. At the core of the review is the discussion of literature from art and design, which is complemented by the review of literature from other practice-led disciplines to convey a more comprehensive picture of the issues under discussion and their cross-disciplinary significance.

Above, we have looked at the problem of knowledge in research as it occurs formalised in research regulations and research requirements. The lack of clarity concerning the contribution to knowledge has also led to discussion and research in the art and design community itself. Indeed, the debate about research and practice in the UK is not new. By now it spans more than a decade and has occurred in various forms. In 1993, Cross (1993: 226) states in the editorial for *Design Studies* that

> There are some quite proper questions to pursue about what constitutes research in design, but the debate of these questions so far has been poorly organised and conducted.

His position is that

> The whole point of doing research is to extract reliable knowledge from either the natural or artificial world, and to make that knowledge available to others in re-usable form.

Cross' position is remarkable in its clarity about the purpose of research within design and in distinction to practice and teaching. Although his position is based on a scientific belief system that assumes objective facts representing an external reality, his position can be understood in a broader sense if the notion of 'reliable knowledge' is interpreted such as to pertain to knowledge that is socially constructed. Cross' position raises similar questions as Green and Powell's discussion, which have been introduced above. For example, we can ask 'what exactly is that which is extracted and which we call knowledge, and how is it extracted "from either the natural or artificial world", and how can this knowledge be made available and re-usable?' An example used by practitioners, which reoccurs in variations, illuminates these questions: surely anyone can read in a (silversmithing) book about making a bowl and thus acquire the knowledge of how to make a bowl (in silver). But still that person may not be able to make that bowl, and certainly not to the high standard that would be expected, say, if the item were for sale.

The question is what has gone missing in the process of eliciting knowledge and communicating it through textual means, and why? Some part of knowledge or something else? And how can this knowledge not only be made available but also re-usable? Is it here then, in the disjunction between doing and textual description of that doing, that we encounter different kinds of knowledge as implied by Green and Powell above? And if part of the knowledge is missing from the explicit knowledge provided by textual description and explanation, do we have to conclude that this other part of knowledge is elusive to research, i.e. its communication? Asking from a different angle to push these thoughts even further: if we want to advance the knowledge of making bowls, and explicit knowledge alone is not sufficient to communicate it, does then follow that research to advance this knowledge must be based in the skills and practice of an individual? How can this knowledge in turn be accommodated by conventional research requirements? These are questions that will come up again and again, and that will concern us throughout the further course of the review to guide our attention.

Nearly one decade later, Durling et al (2002) take a fresh look at the debate about practice-based PhDs in their editorial for the Journal of Design, Sciences & Technology (DS&T). Although they find that the debate has become more widespread, they still find considerable confusion. Some of the confusion for example has been generated by a paper by Frayling (1993) which probes new ground by searching for the meaning of notions such as research *into, by,* and *for* design. Durling et al (2002: 9) state that Frayling's probing thoughts have variously been misread and also they

notice a lack of valid examples of his category of *research by design* (11). The four papers, which follow the editorial, debate the nature and purpose of practice-based research degrees from various angles. They are concerned with the pragmatic development of research and the inclusion of practice in relation to research regulations (Biggs 2002c; Scrivener 2002b) as well as with future developments of research degrees in design in a rapidly changing world (Tellefsen and Love 2002). Although the first two papers touch upon questions surrounding the issue of knowledge in research, they do not offer any detailed reflection on this issue.

Another forum for the discussion of the different issues surrounding practice-based research have been the Research into Practice conferences, with the proceedings published under the title Working Papers in Art and Design (Biggs 2002a). Held biannually since Summer 2000, the 2002 conference was specifically concerned with the issue of knowledge in art & design research and has provided a first broad overview over concerns raised by the research community concerning the problem of knowledge. This overview has revealed a variety of approaches, of which some ask more generally about the nature and form of knowledge in art and design, and about the possibility of different kinds of knowledge (e.g.Cazeaux 2002; Refsum 2002; e.g.Starszakowna 2002). Others focus more on the distinctions and similarities between art & design and research in art & design, and how art can contribute to research and the generation of knowledge (e.g. Russell 2002; Scrivener 2002a). All in all, the variety of papers demonstrate the newness of the debate in the field, which conveys a feeling of searching uncertainty expressed in calls such as

> we should stop attempting to justify the art object as a form of knowledge and should instead focus on defining the goals and norms of the activity that we choose to call arts research. (Scrivener 2002a)

Further, specifically with regard to doctoral education, the Doctoral Education in Design Conferences have contributed to the understanding and practice of doctoral research and education (e.g. Durling and Friedman 2000). However, while the collection of the proceedings has been of importance for the development of research-practice in the field, the literature is still thin and a coherent volume that addresses the respective problems of knowledge is still called for. For example Ken Friedman (2005) posted a reminder on the PhD-design-discussion list in 2005, in which he re-iterates an earlier call from 2001:

> No one has yet mined the riches of five decades of solid work on tacit knowledge for application to design research. We all know that tacit knowledge exists and we all know that it is important. My challenge is this: I assert that it is time for someone to review the literature of tacit knowledge to discover and develop what is already known. I assert that it is time for someone to use this foundation to adapt available information and apply it appropriately to design research and design practice. If we are really to "transcend our present framework," this is what must be done.

That the continued search for more clarity and guidance in practice-based research in art and design is not only a UK phenomenon is demonstrated by the publication of a fair number of handbooks concerning e.g. research in art and/or design (e.g. Anttila 1998, Laurel 2003), practice-based doctorates (e.g. Gray and Malins 2004), practice-as-research (e.g. Sullivan 2005, Barrett and Bolt 2007), and “The Art of Research” (Mäkelä and Routarinne 2006). Thereby the amount of material currently produced on the issue and relationship of research and practice as well as the sometimes heated debates which surface in a number of reviews of the above mentioned works (e.g. by Fisher 2005, Julier 2005, e.g. by Love 2006, Thompson 2006), indicate healthy debate as well as the need for further understanding and clarity. In recognition of the need for direction, the AHRC has commissioned a “AHRC Research Review on Practice-Led Research in Art, Design and Architecture”, which is being conducted by a consortium led by Sheffield Hallam University (2005/6). This review is designed to map current research practice in the field and to offer an assessment of the breadth and depth of current practice-led research to indicate future directions concerning the provision of funding and infra-structure (Rust 2005).

This brief overview over past and current developments indicates that the field is still very much at the beginning of addressing issues concerning the relationship of research and practice and the use of practice within research as a means of integrating experiential knowledge into

research. The following discussion is therefore devoted to analysing the problems of knowledge in the field in more detail.

As we have seen in §2, the requirement for an original contribution to knowledge and understanding has become a leading criterion for the recognition of research. [1] However, what is to be understood with, and therefore currently is accepted as, knowledge has as yet not received satisfactory clarification. The Research into Practice Conference 2002 (Biggs 2002a), which I have already mentioned above, has provided a first forum for the discussion of the meaning of knowledge in art and design research. The variety of papers has conveyed both the newness of the debate in the field as well as a feeling of searching uncertainty. Biggs (2002a) approaches said uncertainties in his editorial to the conference proceedings by defining some of the main questions about knowledge in relation to art & design research. He transforms questions about knowledge from philosophy such as “what is knowledge?” and “what do we know in art and design?” into philosophical questions appropriate to art and design such as “what is knowledge in art and design?” and “what do we mean by the term knowledge in the context of research in art and design?”. He also questions the meaning of

> concepts such as ‘the forefront of knowledge’, ‘the advancement of knowledge’, and ‘making a contribution to knowledge’, and the questions arise ‘how can one advance art and design?’, ‘what is a contribution to knowledge’? (ibid.)

However, the main question for Biggs, which for him precedes all other questions, remains the question about the nature of knowledge. He summarises his position as follows:

> The core for me is a constructivist problem. Have we created our concept of knowledge through examples and peer recognition?: to which I think the answer is no. Or does our concept of knowledge arise as a result of the rationalist debate, as an abstract entity that is conceptually constituted rather than manifested and embodied in examples and experience? Does epistemology not only study the nature of knowledge but construct the concept of knowledge in the first place? This would certainly explain the apparent priority of the word over the artefact.
> I am reminded of the anecdote about Samuel Johnson who was out walking with Boswell when he was told about the ideas of the philosophical sceptic Bishop Berkeley. Berkeley had shown that all our knowledge of the external world derives from sensory experience. Unfortunately, the evidence from our senses is unreliable, therefore we cannot "know" about the existence of matter. On hearing this, Johnson turned to a large stone and gave it a sound kick. "I refute it thus", he said. Was that a refutation, an argument presented through the use of an artefact? If it was, then we are all back in business. (ibid.)

Biggs has continued his inquiry into the understanding of knowledge in research since. In a publication by the Swedish Research Council, Biggs (2004) approaches “models of knowledge and research” (6) from a philosophical perspective and, drawing on Ryle, suggests that there are two kinds of knowledge, i.e. cognitive knowledge or knowing-that and experiential knowledge or knowing-how, which may occur in different modes such as explicit, implicit, or ineffable. He uses this understanding to draw conclusions on the methodology of practice-based PhDs and to claim that the practice-only submission could only be justified if it was possible to establish an ineffable aspect of knowing-that (19). In a paper published in the proceedings of the Engineering & Product Design Conference, Niedderer (2005) takes up on this issue by comparing the aims and characteristics of research and practice. She concludes

> that the perceived differences between research and practice are rooted in the differences between explicit/cognitive and implicit/experiential knowledge [and] that an understanding of the relationship of experiential and cognitive knowledge is the key to bridging the perceived dichotomy between research and practice (9?).

In his most recent paper, Biggs (2006) suggests an approach for overcoming the “epistemic subjectivity, i.e. the essential role of the perceiving subject in the formation of knowledge”, and thus for negotiating the dichotomy between experiential and cognitive knowledge in research. He explains that

> Such subjectivity seems to be a counter-indicator to the normal 'objective' expectations of research [… and that] the paper seeks a resolution to this apparent difficulty. The solution proposed is that the subjective experience of an aesthetic response is taken as an indicator of the presence of a quality called experiential content. Through the conversion of the problem into one of representation, the role of experience is changed from one of presenting content into that of being an indicator of content. This separation of experience and signification addresses the need of research to provide transferable knowledge that can be communicated. (1)

The proposition of experiential content as a bridge between experience and (explicit) knowledge seems a promising approach. However, it also raises some questions. Firstly, the problem about the apparent paradox of experiential knowledge (experience is subjective while the notion of knowledge contains an inherent objectivity-claim), which is introduced at the beginning of Biggs' paper, is not explicitly resolved. It leaves open the question what experiential knowledge *is,* whether Biggs' model excludes experiential knowledge as a component of the outcome of research, or whether it eliminates the notion of experiential knowledge altogether. It also leaves the question unanswered, which the example of advancing the knowledge of making a bowl (§4, above) has raised about the need for experiential knowledge in the process of research (where it appears to be different to feeling), and about the communication of that knowledge so that it can be repeated by others. Finally, the terminology of 'experiential knowledge' implies possible links with psychology where we find debates about experiential content under the hotly contested term of "qualia" (Metzinger 1995), and with philosophy where we find the related term of "non-conceptual content" (Gunther 2003), the study of which might contribute to clarification of this issue.

Two of the issues raised in Biggs' papers, namely the aspect of classifying and relating different kinds of knowledge, and the methodological aspect of communicating knowledge in a form that is re-usable by others, are dealt with in a number of different areas in art & design.

The literature on aspects of classifying and relating different kinds of knowledge is fairly thin. For example, Lachapelle et al. (2003) discuss four kinds of knowledge within the aesthetic reception of art viewing experiences. These are mediating, objectified, (re)constructed, and theoretical knowledge. Although Lachapelle et al. also mention the notion of experiential knowledge, they do not set 'their' categories of knowledge in relation to 'experiential knowledge' or other recognised categories of knowledge. Also, their discussion remains restricted to the area of aesthetic visual reception rather then to provide a model for the larger domain of art & design. In a paper on Smart Object Systems, Strohbach et al. (date?) introduce further categories of knowledge (a-priori, dynamic, and local knowledge), however without a sound theoretical basis. Yet another position is taken by Refsum (2002) who distinguishes "general theoretical knowledge; theory for practice; knowledge of confidence; knowledge of practice or skills" on the basis that

> Artists need knowledge to (do something), as opposed to traditional disciplines that acquire knowledge about (something), which consists of a combination of theoretical and practice-based knowledge.

While her position offers an interesting approach, which aims to pinpoint some of the characteristics of research in art and design, her approach, too, lacks a rigorous contextual understanding of the concept of knowledge. Friedman (2005) has repeatedly pinpointed inconsistencies in the debates on knowledge in design and demanded that researchers in design draw on the insights about tacit knowledge from other fields where the debate is not new and to relate them to design research. He says

> The problem with so much of our discussion in design research is a steadfast refusal to read, and a tendency to neglect entirely the research done in other fields that sheds light on the precise questions we ask… So far, I see many arguments from ignorance on the subject of tacit knowledge. I also see many efforts to fill gaps that have long ago been filled. Many of these efforts fill those gaps less adequately than earlier attempts simply because they are built without knowledge of prior art.

Friedman is correct in his criticism and demand because there is indeed a rich literature on the subject of knowledge, and in particular on cognitive and experiential knowledge, in other fields such as nursing, health care and physiology, psychology and philosophy, engineering, artificial intelligence [AI], business studies, knowledge management and education (e.g. Polanyi 1966; Reber 1989; Hospers 1990; Rolfe 1996; Krogh, Nonaka et al. 2000; Spouse 2000; Crane 2005; Steup 2005; van Kerkhoff 2005).

However despite of a rich literature, also in other disciplines the concept of knowledge remains problematic and the terminology is far from coherent. One of the better defended positions concerning different kinds of knowledge is offered by Higgs and Titchen (1995) in the domain of nursing. Higgs and Titchen begin their paper with the question of the nature and definition of knowledge, then they discuss different paradigms as frameworks for the generation of knowledge, and finally they discuss different ways of knowing from which they develop their model and classification of different types of knowledge. Both their approach to the problem of knowledge as well as their attempt to integrate categories of knowledge from other previous research is much needed. Also their expansion of the conventional distinction of propositional and non-propositional knowledge through sub-dividing the concept of non-propositional knowledge into 'professional craft knowledge' and 'personal knowledge' is very interesting. They relate the three types of knowledge as follows:

> We have presented propositional knowledge as being public, objective knowledge of the field and knowledge of the external world, and professional craft knowledge as knowledge within the professional domain which has both public and individual forms. Professional craft knowledge relates particularly to theory-in-use and non-declarative forms of knowledge (e.g. tacit knowledge and intuition). In addition, we present a third category of knowledge which has particular relevance to clinical reasoning in the health professions: personal knowledge…
> Personal knowledge needs to incorporate affective (feelings), conative (purposefulness, will) and spiritual elements of self, to look beyond the limits of cognition (528).

However, while interesting, their approach falls short in two ways. Firstly, although Higgs and Titchen draw for their categorisation on the philosophical concepts of propositional and non-propositional knowledge, they do not develop their understanding of those terms, including their chosen sub-terms, from the original meanings of these philosophical concepts. Secondly, in developing their different categories and definitions of knowledge, nowhere do they refer those back to their originally chosen definition of knowledge, which had been developed out of the context of the health disciplines and psychology at the beginning of their text. The consequence of this incoherence (and perhaps the limited space of their paper) is that, although ambitious, the framework of terminology which they have developed remains based on other people's use of the different terms and lacks consequential development of the terminology.

In this context, I want to discuss two further approaches. The first approach is by Neuweg (2002; 2004) who examines the problem of the relationship of explicit and tacit knowledge in the context of business education. The second is by Nonaka and Takeuchi (1995) who deal with knowledge for the purpose of knowledge management.

Neuweg investigates the structure and nature of implicit/tacit knowledge and the consequences of this for education in order to understand problems such as why certain taught knowledge remains inert (Neuweg 2004: 46). His study is based on Polanyi's *The Tacit Dimension* (Polanyi 1966). Additionally, it draws on Ryle's *Concept of Mind* (Ryle 1948), and Schön's *The Reflective Practitioner* (Schön 1991). In his study, Neuweg (2002) investigates tacit knowledge in relation to explicit knowledge and defines various terms concerning this relationship: he distinguishes three meanings of the term 'tacit' (i.e. 'tacit' can be used in the sense of 'intuitive', 'ineffable', or 'creative' knowing) as well as of 'tacit knowledge'; he distinguishes 'knowing' as an active quality from 'knowledge' as a static state expressed in 'facts', 'rules' and 'theories', and he examines the relationship of knowing-that and knowing-how in relation to explicit and tacit knowledge.

The most important result from his analysis for our research project is his conclusion that even explicit knowledge always has a tacit/experiential component, and that this means tacit and explicit knowledge are inseparable. However, some knowledge can be made explicit more easily than others. On a theoretical level, this conclusion delivers the explanation why certain knowledge remains inert when taught in the classroom. On a pragmatic level, Neuweg (2002: 45) concludes that "although tacit knowledge is not teachable, it is coachable" involving "a process of *interiorisation",* i.e. of empathy.

Interestingly, Nonaka and Takeuchi (1995) take a different approach, but arrive at similar results. They are concerned with knowledge and knowledge creation for the purpose of knowledge management and innovation within companies where the need for knowledge sharing plays a central role. Nonaka and Takeuchi develop their understanding of knowledge from a historical review of knowledge considering both Western dualistic perspectives as well as the Japanese intellectual tradition of one-ness (21ff).

Their conclusion from this review is firstly that for their purpose in knowledge management it is more useful to talk about explicit and tacit knowledge rather than about the philosophically based dichotomy of propositional and non-propositional knowledge, because the conversion of tacit into explicit knowledge and vice versa is a key concern in sharing knowledge. Secondly, (and like Neuweg) they come to the conclusion that explicit and tacit knowledge should not be seen as separate entities but as closely related.

Nevertheless, they accept that knowledge appears in these two forms, and suggest a model of knowledge conversion. For this model, they maintain and build on the philosophical definition of knowledge as 'true justified belief', while at the same time they point out that this definition needs to be interpreted to become applicable for knowledge management. [2] They suggest that justification is more important than truth in the context of knowledge management, because tacit knowledge that is personal has to be made explicit to become organisational and it has to be justified to become available and recognised for use within an organisation. They propose a four-step-model of knowledge conversion for the purpose of knowledge creation and management. They explain that

> Knowledge creation takes place at three levels: the individual, the group, and the organisational levels. Therefore our discussion of organisational knowledge creation consists of two major components: the forms of knowledge interaction and the levels of knowledge creation. The two forms of knowledge interactions – between tacit knowledge and explicit knowledge and between the individual and the organisation – will then bring about four major processes of knowledge conversion, which all together constitute knowledge creation: (1) from tacit to explicit; (2) from explicit to explicit; (3) from explicit to tacit; and (4) from tacit to tacit. (ix)

These four stages, which Nonaka and Takeuchi also call externalisation, combination, internalisation, and socialisation, succeed each other in a spiralling movement in the process of knowledge creation. To discuss their model in more detail with regard to its relevance for research in art & design will be the task of future research. What is of interest at this point is that similar to Neuweg, they see explicit and tacit knowledge not as two different kinds of knowledge but rather as different modes of appearance. In a further step, similar to Biggs (2005), Nonaka and Takeuchi (1995) differentiate two aspects of tacit knowledge. They explain that

> … tacit knowledge can be segmented into two dimensions. The first is the technical dimension, which encompasses the kind of informal and hard-to-pin-down skills or crafts captured in the term 'know-how'. A master craftsman, for example, develops a wealth of expertise 'at the fingertips' after years of experience. But he is often unable to articulate the scientific or technical principles behind what he knows.
>
> At the same time, tacit knowledge contains an important cognitive dimension. It consists of schemata, mental models, beliefs and perceptions so ingrained that we take them for granted. The cognitive dimension of tacit knowledge reflects our image of reality (what is) and our vision for the

> future (what ought to be). Though they cannot be articulated very easily, these implicit models shape the way we perceive the world around us. (8)

This position also overlaps interestingly with the distinction that Higgs and Titchen make concerning personal knowledge and professional craft knowledge, and it is further supported by an observation by Neuweg. Neuweg (2002: 42) offers an example from the 1960s where a Canadian Research Laboratory successfully built a so-called TEA-laser. British attempts to replicate the laser on the basis of written information however failed as long as the tacit knowledge of informants who had participated in building the original laser was not included through their personal engagement in the replication-project.

These views and examples indicate that tacit knowledge plays an important part in generating and (re-)using knowledge. Their consideration might therefore be important for the examination of both methods and regulations concerning the relationship of experiential knowledge and research. They may also offer avenues of dealing with the aspect of creativity in art and design research. Especially a further distinction made by Scharmer in extension of the concept of Nonaka and Takeuchi may be useful in this context. Scharmer (2000) distinguishes

> … two types of tacit knowledge: embodied tacit knowledge and not-yet-embodied tacit knowledge. An example of embodied tacit knowledge is the act or process of baking bread (Nonaka and Takeuchi 1995). An example of not-yet embodied tacit knowledge is the invention of baking bread in the first place. (38)

Together with Nonaka's model of knowledge creation, this approach might offer a bridge between creative practice and knowledge generation in the context of research through recognising the creative nature of art and design and reflecting it in the future-directed nature of its research, i.e. research in art and design will be directed towards *what may be* rather than towards *what is* or *what was* (Niedderer 2004: 24-27).

For this part of the review, literature has been drawn from art and design as well as from other practice-led disciplines. This has highlighted that the problem of experiential knowledge is a concern which is of interest to a wide audience, but that no systematic and comprehensive review has been done to draw the potential of existing approaches together to advance the understanding and conduct of research. The problems identified through the review have raised interesting questions concerning the role of experiential/tacit knowledge in research. Two concerns are of particular interest to this project. There is firstly the emerging understanding that experiential and cognitive knowledge (often dealt with as tacit and explicit knowledge, a distinction which the author investigates in a forthcoming paper about the nature of knowledge) represent different modes of knowledge rather than different kinds of knowledge. Secondly, there is an emerging understanding (or assumption) that experiential knowledge comprises of two components, one that is ineffable and another that can be made explicit.

The main problems that emerge for investigation from the review are firstly the need for a clarification of the meanings and relationships of the different concept(s) of knowledge in relation to art and design research, and part of which must be the clarification of the terminology. Secondly, there is the need for relating such a newly derived and more comprehensive understanding of knowledge back to art and design research to see how this will affect and develop our understanding of it.

4) Conclusion

The aim of this review of available research literature and current developments in art & design research has been to show that no detailed and comprehensive review of research in relation to knowledge has been conducted so far. Although the review has revealed that there are some initiatives which have explicitly aimed to promote the understanding of knowledge in art & design research such as the Research into Practice conferences by which this review has been inspired, it has also shown that so far there has been no systematic and comprehensive inquiry into the understanding of knowledge in art and design. In due course, this review has provided the first overview over the indicated territory. It has served to provide a brief analysis of research regulations and requirements with regard to knowledge. From this, key issues have been identified to structure the review of the understanding of knowledge in the field and of ways and methods of dealing with knowledge in research pragmatically.

The review has revealed a significant concern with the understanding and role of knowledge in research. It has also revealed problems and uncertainties, often reflected in uncertainties about the use of methods, due to the lack of overarching framework for integrating different kinds of knowledge. Accordingly, the review has indicated the need for investigation of:

- the understanding of the different concepts of knowledge

The first issue concerns the role and understanding of different kinds of knowledge in art & design research, which was implied, but not discussed in the Chapter by Green and Powell, and which was omitted or taken for granted in the definitions of the research requirements of the AHRC and of the RAE. Central to the discussion of the role and understanding of knowledge in art & design research will be the inquiry into differences in the nature of knowledge in relation to research and practice as well as an attempt to unify the disparate terminology that is being used to discuss knowledge within and across disciplines.

- the impact of an advanced understanding of knowledge on research requirements and regulations

The second issue concerns the clarification and integration of the meaning of knowledge into research requirements and regulations with benefit for a clarification of research conduct and of the use of practice within research. It may also be helpful for a formal clarification of the relationship of research and practice in terms of their advancement of the field through the generation, communication and implementation of knowledge.

- the impact of an advanced understanding of knowledge on the pragmatic conduct of research

The third issue is about the pragmatic aspect of dealing with knowledge in research and practice. This issue is twofold. It concerns methodologies and methods for the generation, elicitation & communication of knowledge on the one hand, and for the application, implementation or use of knowledge on the other. The model of knowledge conversion (Nonaka and Takeuchi 1995), which has been developed as a means of bridging the gap between explicit and tacit knowledge and of sharing tacit knowledge, may be explored as a framework for relating different kinds of methods for the generation, elicitation, communication, and application of research knowledge.

To summarise, the findings of this review indicate that a detailed investigation of the issue of knowledge promises to gain substantially new understanding on the formal and pragmatic understanding and conduct of research in art and design. In line with these findings, our future work will investigate the nature of knowledge relevant to art & design as well as possible forms of its embodiment and communication in relation to formal research requirements and research pragmatics.

Endnotes

[1] An exception to this is the requirement for professional doctorates, which require an original contribution to practice rather than an original contribution to knowledge. This raises the question as to what the difference is between an original contribution of knowledge and an original contribution to practice - if there is any. Perhaps one distinction might be that the original contribution to knowledge has to be generalisable while the original contribution to practice does not. However, this does not necessarily imply a difference in the nature of both contributions, but rather re-iterates the need to clarify the relationship of the knowledge contribution and the advance of the field. This issue will by the subject of future research.

[2] The relevance and interpretation of the definition of knowledge as 'true justified belief' for art and design will be a point of investigation in Part 2 of the EKP which is concerned with the review of the meaning of knowledge in/for art and design

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Niedderer, K. (2007a). A Discourse on the Meaning of Knowledge in the Definition of Art and Design Research. *European Academy of Design Conference 2007*. Izmir, Turkey.

Niedderer, K. (2007b). Mapping the Meaning of Experiential Knowledge in Research. *Design Research Quarterly,* 2 (2).

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