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A TAXONOMY OF RESEARCH STYLES FOR THE CHARTERED SURVEYING PROFESSION: RESEARCH INTO PRACTICE, FOR PRACTICE, AND THROUGH PRACTICE

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ABSTRACT

Recent years have seen the growth of an international research community which defines its research primarily in terms of its relevance to the surveying profession. Nevertheless, the nature of its relationship with the profession, and the precise mechanism by which its research is intended to contribute to practice are rarely articulated. This paper therefore presents a taxonomy of research styles within the field and discusses the significance of each in relation to practice. Research into practice is shown as making contributions to the profession's disciplinary knowledge base, and to represent the majority of research currently undertaken. The paper identifies two other approaches that have largely been neglected but which also have valuable contributions to make. The first of these, research for practice, is shown as having the potential to deliver ready-made professional solutions that are capable of immediate implementation in practice. The second, research through practice, is seen as offering the unique possibility of capturing tacit knowledge from practice, and of making this available as part of the established corpus of professional knowledge.

Keywords: Design science, practice research, reflection, reflective practice, tacit knowledge.

INTRODUCTION

As demonstrated by its longstanding commitment to the annual COBRA conference the Royal Institution of Chartered Surveyors places great value on the contribution which research can make to its members' areas of professional practice. The period since the first COBRA conference in 1994 has therefore seen the emergence, and subsequent growth to maturity, of a vibrant international research community which defines its research activities primarily in terms of their relevance to the practice of surveying.

Nevertheless, despite this clear orientation towards practice, the precise nature of the community's relationship with the day-to-day world of the practitioner, or of the way in which particular research projects might contribute towards it, are seldom articulated. As such, it is sometimes difficult to identify the precise contribution that individual research projects are intended to make to practice, or to evaluate their success in so doing.

This paper therefore seeks to clarify the nature of the relationship between the surveying profession and its research community and, in particular, to more clearly articulate the nature and function of three different styles of practice-related research.

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The taxonomy so-presented – *research into, for and through practice* – is underpinned by a synthesis of two earlier models from the field of art and design, articulated by Frayling (1993) and Archer (1995).

THE NATURE OF PRACTICE

Before considering the taxonomy in detail it is helpful to first define the concept of ‘practice’. At its most obvious, the term can be understood simply as the antithesis of theory. A dictionary definition therefore describes it as “the actual application or use of a plan or method, as opposed to the theories relating to it” (OED 2004).

This is a familiar view of practice, and one which is implicit in the oft-made distinction between ‘pure’ and ‘applied’ research. This suggests that pure research is concerned with theory, whilst applied research deals with the application of such theory in practice. This view – described by Schön (1983) as one of ‘technical rationality’ – tends to see practice in terms of the site at which practitioners apply theory which has previously been developed elsewhere.

A less reductionist view of practice places emphasis on the role of people within it, and on its significance for those who engage in it. Above all, it sees the components of practice – typically activities, various forms of communication, as well as material artefacts – as only being given coherence by virtue of the *meaning* that participants attach to them. In this vein, Johannesson & Perjons (2012, p. 2) therefore describe practice as “a set of human activities performed regularly, and seen as meaningfully related to each other by people participating in them”.

This social dimension of practice is evident in Wenger’s (1998) notion of ‘communities of practice’ that exist between participants, and in the meanings that they negotiate with each other about the activities in question. It also explains the tacit knowledge and understanding shared by participants about the nature of their practice, described by Bourdieu (1990, p. 61) in terms of a *practical sense* or *practical logic* of their social or professional environments. In one sense, underlying principles of knowledge (or ‘theory’) are not therefore absent from practice at all, but simply implicit, and embedded within it. This, in turn, perhaps suggests a need to take particular account of the existing tacit professional knowledge of practitioners in proposing any research-generated prescriptions that might potentially impact on their areas of practice.

Against this backdrop let us now explore the three-fold taxonomy of research styles proposed by this paper. We begin with the concept of ‘research into practice’.

RESEARCH INTO PRACTICE

In the context of art and design Frayling (1993, p. 5) describes research into practice as “the most straightforward and...by far the most common” and the same observation could be made about surveying-related research.

Research into practice is characterized by discipline-specific investigations of particular aspects of practice and its underlying knowledge base, and a commitment to the relevant disciplinary methodologies. It produces what Jarvis (1999) describes as “metatheory about practice” and is synonymous with Gibbons et al’s (1994) notion of

mode 1 knowledge – disciplinary, theoretical knowledge generated in the academy for subsequent application in practice.

Candy (2006) describes this approach as “practice-led” research which she defines as being concerned with the nature of practice and the production of knowledge that has “operational significance” for that practice. The main focus of the research is to advance knowledge *about* practice, or *within* practice.

Archer (1995, p. 11) emphasizes that this style of research can be undertaken either in the natural or social sciences, or in the humanities. Although researchers in the surveying field would rarely categorize their contributions in terms of humanities-based research, reviews of literature and practice, critiques of existing thinking, and theoretical explorations of the professional knowledge base or practice can all be viewed in these terms. In contrast, surveying-related research in the natural sciences might typically consist of empirical investigations into the characteristics of materials, structures, environmental science, or other engineering aspects underpinning the surveyor’s professional role. However, the majority of work in the field currently addresses the managerial, economic, policy and process aspects of profession, often through empirical enquiry and, as such, falls most logically within the domain of the social sciences.

It is therefore probably not coincidental that the field is characterized by concerns and debates about research paradigms and methods that are a particular feature of research within the wider social sciences (see, for example, Seymour et al 1997; Runeson 1997). Nevertheless, most researchers in the field would probably subscribe to Archer’s (1995, p. 10) advice in terms of maintaining the academic legitimacy of their practice-related research: “all studies about practice, if they are to be recognized as research studies, must employ the methods, and accord with the principles, of the class to which they happen to belong”.

RESEARCH FOR PRACTICE

Archer (1995, p. 11) describes this next style of research as “research which is undertaken for the purposes of contributing to practitioner activities”. Most obviously, it consists of all those investigations which practitioners undertake as background preparation for the main focus of their professional roles. In a surveying context this might, for example, include the study of legislation, technical codes, or recent technological advances which impact directly upon the project at hand.

Significantly, however, the purpose of such research is not the knowledge so-produced, which Frayling (1993, p. 2) describes in terms of “reference materials” in order to distinguish them from the outputs of academic research, but the resulting professional contribution which is underpinned by it. It is helpful to understand these professional contributions as artificial man-made constructs, or *artefacts*. Artefacts can consist of physical entities, for example buildings, but conceptual advice - for example a plan of action or a design - would also fall within the definition.

Another view of research for practice is that it can also offer an important alternative paradigm for academic research within a surveying context, and one that is potentially as rigorous as the approaches of the more familiar research into practice paradigm. This view, which has recently been advanced in relation to construction management

research (for example, by Koskela 2008), considers that natural and social science methodologies are incapable of producing research which is relevant to practice, and calls instead an approach where the professional contribution (or *artefact*) is central to the research process.

Such calls typically advocate the adoption of either a ‘constructive’ (Oyegoke 2011) or, more usually in the English-speaking world, a ‘design science’ (Voordijk 2009, 2011) research approach. The former has its origins in Finland although it is said to draw upon the tradition of American pragmatism (Kasanen et al 1993; Lukka 2003). The latter is a product of the design science movement of the 1960s which aimed to eliminate subjectivity from the design process, and through the development of systematic and rational procedures, to promote the concept of design as a science (Gregory 1966). Despite their differing origins the constructive and design science approaches are broadly similar and, because the latter is a better developed concept in the English language literature, this term will be used throughout the remainder of this paper.

Advocates of design science draw an epistemological distinction between the natural and social sciences on the one hand, which can be collectively referred to as the *explanatory* sciences, and what they variously describe as the design, or *artificial*, sciences on the other (for example, Simon 1969). Whilst the former attempt to *describe* past or existing states of affairs in the natural or social worlds, the latter seeks to *prescribe* future action through the development of man-made artefacts. In philosophical terms the former is concerned with what *is*, whilst the latter addresses what *ought* to be. Unlike the explanatory sciences, design science can therefore be distinguished as a *normative* exercise.

In vocational, real world environments it is argued that the purpose of research should be to make a difference to those worlds. It is sometimes suggested that research which aspires only to analyze and interpret what has already taken place is, by definition, incapable of so-doing (Kasanen et al 1993, pp. 248-9). Understanding a problem, as pointed out by van Aken (2004, p. 220) is only halfway to solving it. What is required instead is a research approach which looks to the future and which sets out to develop and test solutions which are capable of addressing actual problems in the professional environment (van Aken 2004, p. 225). Rather than primarily seeking to develop *conceptual* knowledge for consumption by the academic world this approach to research is therefore primarily concerned with the development of *instrumental* knowledge – that which is capable of immediate use in the context of practice (Pelz 1978; van Aken 2004).

The process of design science research seeks to achieve these goals. Perhaps unsurprisingly, as a child of the design science movement, its approach is logical, deliberative, and procedure driven. As such, although presenting a challenge to prevailing research paradigms, it is able to demonstrate the kinds of academic rigour that are normally associated with conventional explanatory sciences. Koskela (2008, p. 57) summarizes the design science approach as one of “build and evaluate” – designing and producing an artefact, and then checking that the original problem has been solved. The series of activities in a design science project will inevitably vary from project to project. However, Johannesson & Perjons (2012, p.44) present a useful generic design science process template and this is illustrated in Figure 1.

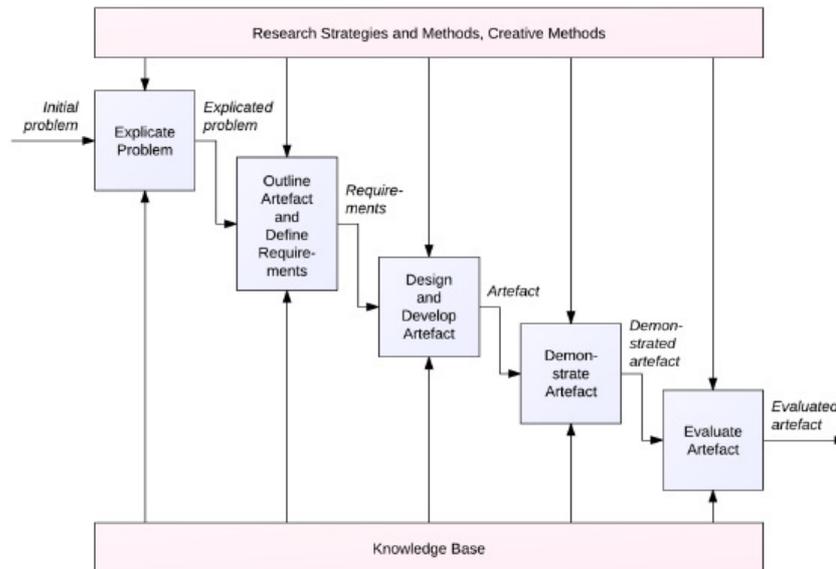


Figure 1: Generic Design Science Process Template (Johannesson & Perjons 2012)

According to this template a project will typically move through five stages, starting with the analysis and development (explication) of a real world problem and culminating in the evaluation of the solution (artefact) that has been developed to address it. The intervening stages involve defining the requirements of the potential artefact and designing and developing it in accordance with those requirements. Then, prior to the final detailed evaluation, a feasibility or ‘proof of concept’ stage will be undertaken to demonstrate that the artefact is at least capable of addressing the explicated problem in a single instance.

Despite contrary appearances Johannesson & Perjons (p. 35) emphasize that the process is not necessarily sequential. A project will therefore typically proceed in an iterative way, moving back and forth between the various activities, rather than following a linear trajectory. As such the arrows in Figure 1 represent input-output relationships rather than suggesting the actual order in which each of the activities must be undertaken. They also stress (p. 40) that individual projects will not necessarily undertake all five activities to the same level of detail. Depending on the emphasis of the research it is therefore possible for a project to focus in detail on – say - one or two of the activities, and to deal with the other aspects more superficially.

Figure 1 also illustrates two other aspects in addition to its treatment of the five activities. Firstly (at the top of the diagram) it indicates that each of the five activities will draw upon a number of strategies and methods in order to achieve their objectives. These will vary according to the nature of the project. Nevertheless, whilst the prescriptive nature of designing and development the artefact must inevitably employ what Johannesson & Perjons (p. 39) refer to as “creative methods”, the other activities will typically make use of research strategies drawn from the explanatory sciences.

Although any research strategy might potentially be used, experiments, surveys, case studies and action research might be expected to feature quite prominently in a number of the identified activities, supported in each case by appropriate methods of data

collection. Finally (in the bottom rectangle) the diagram reminds us, as with any form of academic research, that all stages of process and findings must be properly supported by an underlying knowledge base or theory through engagement with the relevant literature. This is, of course, necessary in order to demonstrate that the research contribution is both well-founded, and original.

The process described above is not a new one. As many authors point out (for example Kasanen et al 1993, p. 247; van Aken 2004, p. 221; Koskela 2008, p. 53) it represents the dominant paradigm in medical research and precisely reflects the ways in which new pharmaceutical products are developed and tested. It also now has a similar status in the context of information systems research (March & Smith 1995; Hevner et al, 2004).

Apart from the authors previously cited, few researchers within surveying as yet describe their research in terms of the design science paradigm. Nevertheless, as noted by Koskela (2008, p. 58), much research within the field is, in substance, of a design science nature. Unfortunately, this is often incorrectly categorized in terms of the explanatory sciences, with inappropriate methodologies sometimes applied as a consequence. The suggestion here, is that the surveying academic community could usefully define appropriate aspects of its research in terms of research for practice / design science research, and that this could assist in clarifying the nature, purpose, and methods to be employed in research of this nature.

RESEARCH THROUGH PRACTICE

Archer (1995, p. 11) explains, “there are circumstances where the best or only way to shed light on a proposition, a principle, a material, a process or a function is to construct something, or to enact something, calculated to explore, embody or test it”. These circumstances will typically arise where the knowledge employed within practice is such an inherent part of the associated activity that it would be impossible to isolate it without first having engaged in the activity itself. As the term suggests therefore, our final style of research moves a further step closer to practice and utilizes the actual process of practice as the vehicle by which the investigation is undertaken. Archer (ibid) describes it as “systematic enquiry conducted through the medium of practical action”.

Whilst the process of such research must, by definition, involve the active participation in the relevant area of practice, it must also incorporate the means by which the knowledge which is inherent in the activities of that practice can be exposed, made explicit, and subjected to critical scrutiny. This has been described by Jonas (2007) as an “action-reflection” approach, whereby the immediate experience of practice is combined with a detached exploration of what has taken place from a more academic perspective. This twin-track approach is perhaps synonymous with Walzer’s (2002, p. xviii) notion of the “connected critic” and in Eisner’s (1976) concept of “connoisseurship and criticism”.

This approach is already familiar within architecture where it is generally referred to as “practice-based research” (Candy 2006). An important ingredient of the practice component of this style of research will consist, not simply of the experience of practice, but also of the resulting output, or *artefact*, of that practice. Rust et al (2007, p.12) explain such research in terms of exploring “issues, concerns and interests”

which are “examined and brought out by the production of an artefact”. Thus, the artefact itself, as well as the process by which it is produced, will also provide a focus for the research. For this reason, doctoral awards for practice-based research are typically examined through a combination of completed artefact and an accompanying critical review (or *exegesis*) which explores its significance, context, and knowledge claims.

Despite a shared focus on the artefact this style of enquiry should be distinguished from design science research. Indeed, as described by Cross (2001, p. 50), to some extent it can be seen as a reaction to it. The design science movement’s mission to scientise the process of design has maintained its momentum in engineering, information systems and industrial design. However, the 1970s saw a backlash against it from designers who saw their profession as an intuitive one, and more concerned with the utilization of personal insights and skill in unique situations than with the rigorous adherence to process which one associates with the scientific method.

The alternative *research through practice* perspective finds its roots in two separate, but equally seminal, contributions to the literature on policy and practice. In the first of these Rittel and Webber (1973) introduced the notion of ‘wicked problems’ whose very nature means that they are open-ended and incapable of solution by the scientific methods. They identified problems in planning and design as falling into this category and contrasted them with so-called “tame” problems, having logical solutions which are amenable to the techniques of science.

The second contribution is Schön’s (1983) concept of the reflective practitioner. In a similar vein to the wicked problems identified by Rittel and Weber he saw much of practice as “a swampy lowland where situations are confusing ‘messes’ incapable of technical solution”. Given the nature of this environment he rejected the dominant model of technical rationality – the view that professional practice consists of the application of knowledge to instrumental decisions – and proposed an alternative epistemology of practice. This maintained that much professional knowledge is inherent within the intuitive actions of experienced practitioners as they deal with the unique and uncertain problems of practice, and that this knowledge is accessible through a process of reflection. Cross (2001, p. 54) describes this approach as one which “puts trust in the abilities displayed by competent practitioners and tries to explicate those competencies rather than to supplant them”.

As well as noting the role that reflection – both *in* and *on* action - plays in the natural development of professional knowledge he also introduces (pp. 307 – 325) a model of *reflective research* by which professional knowledge can be articulated in an academic context. Jarvis (1999) develops this further and articulates a concept of tacit professional knowledge being made explicit through a process of reflection, thereby developing theory from practice. In contrast to his earlier concept of ‘metatheory *about* practice’ (the disciplinary, mode 1 knowledge products of research *into* practice) he describes the knowledge so-produced as a ‘theory *of* practice’. Although developed in a very different way from traditional forms of academic knowledge it too is explicit and theoretical, and therefore capable of contributing to the corpus of established knowledge within a particular field.

Cross (2001, pp. 54 – 55) provides an example of this approach in a design context which might also be applied directly to some of the professional activities within certain branches of the surveying profession. He describes this as “design thinking research” which aims to make explicit the “designerly ways of knowing” that make up the designer’s tacit professional knowledge base. He identifies three forms that such knowledge might take, each of them being uncovered through a process of action and accompanying reflection. He describes the first of these as knowledge inherent in the *activity* of designing which can be gained through “engaging in and reflecting on that activity”. The second is knowledge inherent in existing *artefacts* which a designer uses as inspiration for further designs. This can be acquired through “using and reflecting upon the use of those artefacts”. Finally, knowledge inherent in the process of *manufacturing* artefacts becomes accessible via a process of “making and reflecting on the making” of those artefacts.

CONCLUSIONS

This paper has described three very different styles of practice-related research, each of which is capable of making a valuable contribution to the practice of surveying, as well as to the academic knowledge base that is associated with it. The concept of research *into* practice is a familiar one and reflects the majority of research that is currently undertaken within the field. Although subject to criticism by those who advocate alternative models it produces much useful knowledge. All professions are underpinned by a core disciplinary knowledge base and this style of research addresses this aspect.

The other approaches are less familiar and less well-utilized by researchers within the field. The first of these, research *for* practice, has been described here in terms of the established tradition of design science research. It has an obvious contribution to make in delivering ready-made professional solutions that are capable of immediate implementation in practice. The second, research *through* practice, offers the unique potential to capture the more ephemeral mode 2 knowledge that is generated in practice, and to articulate this in the very different environment of the academy. This, in turn can then be added to the corpus of knowledge associated with research into practice, and can be fed back into the professional arena as part of the developing professional knowledge base.

Thus, although presented here as alternative approaches to knowledge creation, each can be seen as complementing, and feeding into, the others. The three-part taxonomy can nevertheless provide a useful tool by which to understand the relationship between particular approaches to research, and the nature of the contributions that each can make to practice. An awareness of the diversity of research styles might also assist the field in embracing approaches that have much to offer but which, to date, have largely been neglected.

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