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Epistemological Positions in Design Research: A Brief Review of the Literature

Luke Feast, Gavin Melles

Swinburne University of Technology, Melbourne, Victoria, 3181, Australia

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ABSTRACT

Design research is not simply concerned with speculations regarding the relationship of theory and practice. Design research also brings out significant questions regarding the nature of research and the position occupied by the doctorate in university education. This paper reviews the major epistemological positions informing theories of design research. Analyses of examples from subjectivist, constructivist and objectivist epistemologies are presented. The paper concludes by considering the pedagogical implications of the role of disciplinarity in discourses of design research. The paper does not aim to seek statistical generalization but rather to explore the complexity of the issue.

INTRODUCTION

In recent years, tertiary design education has had to change significantly as it has made the transition from the vocational training characteristic of the polytechnic to the academic tradition of the university. The transition to the university and the establishment of doctoral programs specific to design has brought the issue of the relationship of scholarly research and creative practice to the forefront in design education's academic community (Candlin 2000; Hockey & Allen-Collinson 2000). However there is considerable variation, disagreement and misunderstanding across universities internationally regarding the nature of practice-based research and in particular how it relates to doctoral education in design (Archer 1995; Durling 2002; Frayling 1993; Pedgley & Wormald 2007). Consequently the rigor and robustness of practice-based doctorates has become the subject of significant debate and an important topic of major international conferences and publications.

Untangling the complexity of the issue of creative practice and research requires significant time and effort, though to put it very simply, there are three main positions which in turn build on theories of designing as either, direct making, reflective practice or rational problem-solving and which broadly correspond with subjectivist, constructionist and objectivist epistemologies. The subjectivist position is shown for example by those within the community of art and design researchers who argue that all practice is research and that a thesis (written text) is unnecessary as knowledge produced through the research may be read in the artifact (Frayling 1993; Candlin 2000; Prentice 2000). The constructionist position holds that designing in itself is not research unless it is also accompanied by reflection upon the process of making (Cross 2001; Dorst 2008). The objectivist position emphasizes the logical construction of theories based on discrete empirical facts (Friedman 2003; Owen 1998; Biggs & Büchler 2007). This caricature necessarily hides much of the complexity of the issue and in order to address this complexity more adequately, a closer examination of the relationship between epistemology and the research process is required.

I. A KNOWLEDGE FRAMEWORK

A large number of different terms have been used to refer to creative practice in research in art and design, and these terms are often used synonymously as 'methodologies', 'approaches', 'perspectives', and 'philosophies' as if they are all comparable (Niedderer & Roworth-Stokes 2007:7). However in order to make meaningful distinctions between the different positions and make their respective epistemological assumptions explicit a more structured knowledge framework is needed. Michael Crotty (1998) in his book *The Foundations of Social Research: Meaning and Perspective in the Research Process*, frames the research process as composed of four basic elements: epistemology, theoretical perspective, methodology and methods. These elements provide a structure to understanding the research process and give a ground from which to identify the assumptions about the human world and social life within that world, which are necessarily embedded within the methods utilised to undertake a particular research task. Crotty defines the meaning of each element as follows:

- Epistemology: the theory of knowledge that defines what kind of knowledge is possible and legitimate.
- Theoretical perspective: the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria.
- Methodology: the strategy, plan of action, process or design lying behind the choice and use of particular

methods and linking the choice and use of methods to the desired outcomes.
- Methods: the techniques or procedures used to gather and analyse data related to some research question or hypothesis.

According to Crotty (1998:5) the hierarchical nature of the structure determines that the assumptions embedded in the primary element inform each subsequent element. For example research conducted using the data collection method of *participant observation* is one of many embedded within the methodology of *ethnography*, which itself has been adapted by *symbolic interactionism* which is one of many theoretical perspectives which exemplify a *constructionist* epistemology. It follows then that in this case, the assumptions about *how we know what we know* which are embodied by the theory of knowledge within constructionist epistemology, are also embodied within the findings collected through the method of participant observation.

Epistemology	Theoretical perspective	Methodology	Methods
Objectivism	Positivism Post-positivism	Experimental research Survey research Etc.	Sampling Measurement and scaling Statistical analysis Questionnaire Focus group Interview Etc.
Constructionism	Interpretivism • Symbolic interactionism • Phenomenology • Hermeneutics Critical Inquiry Feminism	Ethnography Grounded theory Phenomenological research Heuristic inquiry Action research Discourse analysis Feminist standpoint research Etc.	Qualitative interview Observation • Participant • Non-participant Case study Life history Narrative Theme identification Etc.
Subjectivism	Postmodernism Structuralism Post-stucturalism	Discourse theory Archaeology Genealogy Deconstruction Etc.	Autoethnography Semiotics Literary analysis Pastiche Intertextuality Etc.

Fig. 1. Examples within Crotty's knowledge framework.

While Crotty's knowledge framework appears to suggest clearly defined distinctions between the three epistemological positions identified, it is important to recognize that within each position there are strong and weak versions. For instance phenomenological research is categorized as constructivist however it is a broad term that can encompass approaches that range from thoroughly objectivist to thoroughly subjectivist. Consequently it is important to note that each epistemology represents a spectrum of similar approaches rather than a discrete, homogenous class.

There are of course a large number of research methods and corresponding epistemological commitments available to researchers in art and design, and many of the most significant articles in the literature seek to outline various models for the different possibilities for undertaking design research. Some try to present total pictures of the breadth of design research – all take particular epistemological stances.

II. Perspectives on Desiging in Design Research

The items included in the review were selected from a bibliography of approximately 300 journal articles, conference papers, book chapters and state of the art reviews which was developed from database searches, existing design research bibliographies sourced from the world wide web, and through previous knowledge of the significant articles relating to the topic developed from research and teaching experience. The citations of the items listed in this initial bibliography were then verified and their ability to be accessed checked. The remaining 150 articles were then ranked by relevance according to key words and then by the number of times each article had been cited in www.google.scholar.com. A final selection of 28 articles was reviewed in depth with the aim to explore the complexity of the issue rather than seek statistical generalization. Examples representing the subjectivist, constructionist and objectivist perspectives are given below.

A. Subjectivist oriented example: Frayling, C. (1993). Research in art and design. Royal College of Art Research Papers, 1(1), 1-5.

Following the philosophy and sociology of science of Paul Feyerbend and Harry Collins, Frayling defends the criticism of the stereotype of scientific research as only positivist or critical rationalist (1993:3). Instead, he maintains that the practice of doing science does not resemble its white coated laboratory stereotype and in fact "involves irrationality, craftman's knowledge rather than propositional knowledge" and a "significant measure of subjectivity" (Frayling 1993:3). Consequently, he argues that there is a lot of common ground between scientific research and the work of artists, craftspeople and designers which, drawing on Herbert Reed's broadly existential or phenomenological book *Education through Art*, he categorizes in three types:

- Research into art and design: Historical research, aesthetic or perceptual research, and research into social, economic, political etc. theoretical perspectives on art and design.
- Research through art and design: Materials research, development research and action research.
- Research for art and design: "Research where the end product is an artifact - where the thinking is, so to speak, *embodied in the artifact*, where the goal is not primarily communicable knowledge in the sense of verbal communication, but in the sense of visual or iconic or imagistic communication." (Frayling 1993:5 emphasis in the original).

Frayling describes research for art and design as part of a "cognitive" tradition of art as a form of research with a "small r" and "a tradition out of which much future research can grow… [A tradition as] much about autobiography and personal development as communicative knowledge" (1993:5). Frayling defines research with a small r, from the Oxford English Dictionary as "the act of searching, closely or carefully, for or after a specified thing or person" and elaborates, "it isn't about professionalism, or rules, or guidelines, or laboratories" (1993:1). In contrast, he associates research with a "big R" with the

professionalization of research in the university sector and chemistry industry. He maintains that examples of the cognitive tradition of research with a small r can be found in the last four hundred years of art practice and gives the examples of Leonardo's drawings of anatomy, George Stubbs' paintings of animal anatomy, John Constable's painting of cloud formations, Picasso's use of reference materials and memories in the painting *Les Demoiselles d'Avignon*, op artists' explorations of perception, "computer artists" and "artists as semiologists".

There are a number of aspects of Frayling's description of *research for art and design* that warrants positioning this theory of research towards the subjectivist end of the epistemological spectrum. For instance, by associating research for art and design with personal, tacit, non-verbal, embodied, craftsman's knowledge and certain works of fine art, Frayling clearly rejects objectivity and defends the place of personal, practice-based, subjective knowledge within postgraduate art and design research

B. Constructionist oriented example: Cross, N. (1999). Design Research: A Disciplined Conversation. Design issues, 15(2), 5-10.

Cross builds on Archer's definition of research as "systematic inquiry the goal of which is knowledge" in order to define design research as the "development, articulation and communication of design knowledge" (1999:5). According to Cross, design knowledge is found in people, processes and products, which in turn correspond to three design knowledge domains:

- Design epistemology: The study of designerly ways of knowing. Cross maintains that design is a natural human ability that includes both vernacular design as well as professional design. Design knowledge of how people design can include both empirical studies of design behavior and theoretical deliberation on how people learn and develop design ability, and also how to teach it.
- Design praxiology: The study of practices and processes of design. Cross defines design processes as tactics or strategies, commonly referred to as design methodology. Design knowledge in this area involves the process of design, development, and application of techniques.
- Design phenomenology: The study of the form and configuration of artifacts. This domain studies the implicit knowledge embodied in precedents and exemplars of profession and vernacular design. This form of design knowledge also concerns relation between products and context in terms of semantics, ergonomics, and environment.

Cross maintains that the domain of design knowledge that will be most helpful to design practice and design education is the study of designerly ways of knowing. Cross (2001:54) defines this knowledge domain within the constructivist "epistemology of practice" developed by Schön (1983) under the term "reflective practice". According to Cross design knowledge in this sense is gained through making and reflecting upon the making of artifacts, and through using and reflecting upon the use of those artifacts. Cross argues that design practice on its own does not constitute research unless it also involves reflection on the work and communication of results. The emphasis on the designer's intellectual reflection upon their activities as the process through which knowledge is produced, and the explicit reference to Schön, places Cross's study of "designerly ways of knowing" within the constructionist epistemological paradigm.

C. Objectivist oriented example: Friedman, K. (2003). Theory construction in design research: criteria: approaches, and methods. Design Studies, 24(6), 507-522.

Friedman, like Cross, takes knowledge to be the core of research. However, while Cross defends reflective practice, for Friedman, knowledge is articulated through systematic inquiry organized in theory and research is the collection of methods that allows us to construct theories. Friedman states, "Critical thinking and systemic inquiry form the foundation of theory. Research offers us the tools that allow critical thinking and systemic inquiry to bring answers out of the field of action. It is theory and the models that theory provides through which we link what we know to what we do" (2003:512).

A theory is an ordered set of assertions that describes a generic behavior or structure in a valid and verifiable way that holds throughout a significantly broad range of specific instances (Friedman 2003:516). According to Friedman (2003:513), a theory in its most basic form is a model that describes how something works by showing the relationship between its elements. Theories develop in a pattern of increasing sophistication in terms of their degree of systematization and level of generalization. Drawing on Parsons and Shils (1962), Friedman outlines a hierarchy of theoretical types that moves from "ad hoc classification systems (in which categories are used to summarize empirical observations), to taxonomies (in which the relationships between the categories can be described), to conceptual frameworks (in which propositions summarize explanations and predictions), to theoretical systems (in which laws are contained within axiomatic or formal theories)" (2003:518).

Friedman (2003:520) argues that the bases of theory construction in all disciplines are empirical facts and explicit articulate statements. According to Friedman this is because those who cannot observe facts cannot theorize them and explicit articulation allows us to contrast, test, consider, share, and reflect on the theories we develop. Friedman states that comprehensive and parsimonious theory allows us to frame and organize our observations in order to develop generalisable answers that can be used by human beings in other times and places. He maintains that theory is a tool that allows us to question what we see and do, in order to discern desirable goals and to create predictable changes to reach them (2003: 521). Friedman's rejection of both tacit knowledge and reflective practice, and method of reduction to empirical facts and construction of theoretical models with the aim of prediction and explanation, positions his general theory of design research towards the objectivist end of the epistemological spectrum.

III. CONCLUSION

While an exhaustive discussion of the differences and implications of each of these three epistemological stances is beyond the scope of this paper, it is useful for our purpose to outline the salient aspects. Following Crotty (1998:7)

- Subjectivist epistemology maintains that meaning is imposed by people's minds without the contribution of the object. This implies that what is perceived is what is real, and that there is no underlying true reality that exists independently of perception.
- Constructivism also rejects the view that there is an objective truth waiting to be discovered. Rather truth and meaning is constructed out of the engagement of our minds with the world. The constructionist stance maintains that different people may construct meaning in different ways, even in relation to the same phenomenon, such as between those in different eras or cultures.
- Objectivist epistemology holds that a meaningful reality exists independently of consciousness and experience, that entities carry intrinsic meaning within them as objects and that we can discover this 'objective truth' if we carefully go about it in right way.

The significance of acknowledging the differences between the aspects of these epistemologies is twofold; first it connects the theory of research to the practice of research and reveals the limits of truth claims in terms of objectivity, validity and generalisability. Second, Crotty's model emphasizes the necessity of remaining epistemologically consistent. Objectivist research must distinguish scientifically established objective facts from people's everyday subjective meanings. In turn, consistently constructionist research must place all meanings, scientific and non-scientific on an equal basis – they are all constructions, and none is truly objective or generalisable. The further one moves towards subjectivism, the greater the limits of the objectivity, validity and generalisablity of one's truth claims (Seale 1999). Being epistemologically aware requires that at each point in the research process we recognize that we make a variety of assumptions about human knowledge, the realities encountered in the human world and the interpretability of our findings.

Arguably, it is a limited understanding of the nature of research coupled with a tradition of professional practice and lack of doctoral level education has seen an attempt to elevate the designed artifact to the status of research and accentuate the practice-based nature of design as the distinguishing characteristic of the discipline. The problem with the rush to legitimize practice-based research as the defining trait of the academic field of design is that it may appeal to students (and academic staff) who may not only have limited exposure to academic scholarship but also an impoverished view of research methodology. This desire for disciplinarity through the emphasis on professional practice can in fact introduce a vicious cycle that undermines the legitimization of design through producing poor research and under-theorizing design. In addition, these moves have not yet proved sufficient to achieve either disciplinary consensus or legitimate academic design research (Melles 2008, unpaged).

The debate concerning designing in design research and its implications for discourses of disciplinarity, is compounded by the fact that interdisciplinarity can be considered as one of the most significant traits of design (Friedman 2003; Cazeaux 2008; Cross 1999). According to Barnes and Melles (2007:2) a greater focus on design's applied nature and inherent interdisciplinarity could profitably overtake the quest for disciplinary clarity. This account suggests that focusing purely on design research methods from within the 'discipline' misses many of the sociological, historical, organizational and political issues concerning design research. The problem of doctoral education in design and the role that practical explorations play with research should therefore be considered as an interdisciplinary problem because its complexity requires taking into account different disciplinary perspectives in order to develop a comprehensive understanding.

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