

Possible Futures for Doctoral Research Training in Design

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Abstract—In this paper, we argue that Design research is basic to countries' national productivity and competition agendas at the same time that vagaries of research training presents as one of the barriers faced by Design Higher Degree by Research students in engaging those agendas. We argue that, given industry requirements for research-trained recruits, students have the right to expect that research training will provide the foundations of a successful career on an academic or research pathway or a professional pathway, but that universities have yet to address problems in their provision of research training for Design doctoral students. We suggest that to facilitate this, rigorous research conducted on the provision of Doctoral programs in Design would serve to inform future activities in Design research in productive ways.

Keywords—Design, Doctoral Design Education, Research Training

I. INTRODUCTION

THE first decade of the 21st Century has seen Australia's research capabilities come increasingly under the spotlight, with a number of parliamentary and policy foci in evidence [1], [2], [3]. Indeed, the recent consultation paper on research training [4] continued the emphasis of issues to be addressed in this field. At the same time, the research literature concentrates on issues surrounding good supervisory practice for research training [5-15]. The majority of the literature focuses on supervision of higher research degrees, largely ignoring those other factors that we have identified as part of what might be considered indeterminate zones of practice [16], or even nuts and bolts concerns such as learning spaces and ways in which these may influence research training outcomes education, only one of the range of factors involved in completions of higher degrees by research [17].

The Australian government continues to focus on strengthening research capacities in the face of increasing pressure on Australia to compete on national and international fronts. As the Department of Innovation, Industry, Science and Research [18] states: "Australia can meet these challenges by inculcating a stronger culture of innovation and strengthening the capabilities that underpin innovative activity across our economy. That is, by: lifting levels of business research and development (R&D) investment; building more and stronger research collaborations within Australia and between Australia and other countries; and improving the human and physical resources available to research organisations to undertake world-class research and innovation" (p. vii). At the same time, Zeegers and Barron [13-15] have identified an apparent inattention to such features of research training programs, a neglect that is still to be addressed at institutional and government levels.

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To date, Australian universities have focused on increasing the completion rates of existing HDRs, as part of their response to meeting the research needs of academia and industry. We accept the thrust of such considerations, but we argue that as well as addressing the pressing need for increased completion rates there is also need for careful grounding of students in the culture of research specific to their fields. Such grounding is needed to develop research literate workers for academia and industry. The Australian government has called for graduates capable of enhancing the country's innovation objectives, and it has referred specifically to design as a means of achieving the desired outcomes. We suggest that the solutions proposed by traditional disciplines for doctoral training ignore the possibilities of design to engage 21st Century innovation possibilities. We draw attention to a neglect in current HDR programs in design what this may imply for graduates and their work, with a specific focus on the suggestive possibilities of active learning. We have turned to the work of Kirschner, Sweller and Clark [19] in relation to active learning and the role of direct instruction in teaching and learning to inform possible directions to take in this regard. 'Direct instructional guidance' they argue, 'is defined as providing information that fully explains the concepts and procedures that students are required to learn as well as learning strategy support that is compatible with human cognitive architecture' (p. 75). We have taken the position that minimal or limited instructional input to student activities is unlikely to produce the sorts of learning outcomes needed to develop research literacy and skills in Design. National and state government priorities in Australia and around the world are looking to design as one way to give them a competitive edge in economic and productivity growth. We argue in this paper that design research is basic to such agendas. Given the articulations of government priorities we can anticipate that the demand for design research graduates will grow as the numbers of skilled and knowledgeable people are demanded in order to meet the demands of innovation that has become an increasingly visible focus in government statements. The question then arises as to how to meet the demand for suitably qualified graduates.

The report, Building Australia's Research Capacity [20] highlights this problem, stating: '...it is evident that postgraduate research is in direct competition with the workforce, particularly at the graduate and entry levels, in the current climate of low professional unemployment' (p. 87). To meet such calls, Australian Universities have focused on increasing the completion rates of existing Higher Degree by Research candidates.

II. RESEARCH TRAINING

At the same time literature around research training identifies the vagaries associated with research [15] as one of the barriers faced by Higher Degree by Research students in their research training. We have argued elsewhere [see for example 21] that semi- or unstructured approaches to research

training provide for happenstance student understandings of the requirements of the research areas of their various disciplines, this being simply not good enough as supporting required research outcomes. Given industry requirements for research-trained recruits, students have the right to expect that research training will provide the foundations of a successful career on an academic or research pathway or a professional pathway. In similar vein, academia and industry have the right to expect that an attribute of any graduate from a research training programs they recruit will be systematic enquiry skills. The competing demands of academia and industry have been highlighted as a problem in the Parliament of the Commonwealth of Australia Research Capacity Report [22] is more than a matter of dichotomies. The same Report has also notes the lack of doctoral qualifications among Australia's academics to be a disadvantageous aspect of Australia's research capacity.

A similar lack has been noted in Australian industry, as pointed out by Carr [2], the then Commonwealth Minister for Innovation, Industry, Science and Research. Carr calls for more PhDs to be involved in industry, describing the 'cultural divide between public research and private business' (p. 2) as a weakness in current configurations of relevant research training programs. It is an issue of particular concern in the design field, in which postgraduate qualifications are relatively new and the proportion of doctoral qualified staff in design faculties is below the norm for other disciplines.

As early as 2000, the conference *Doctoral Education in Design: Foundations for the future* [23], and as recently as 2011, the *Hong Kong Doctoral Education in Design: Design for a better world Conference* [24] addressed ways in which research in the design field could move forward as well as inhibit such progress as far as the provision of doctoral degrees in Design was concerned. Our reviews of the papers given at both these conferences have indicated that in the intervening years, no real progress had been made within design itself on such matters. One of the main issues to emerge from that examination has been that the provision of doctoral degrees in design was based on a tangential connection of design to either art or engineering. Given this lack of progress, we would argue for the timeliness of a particular focus on design itself as a discipline in its own right, based on established particularities of design research, within a framework of coherences.

III. PROBLEMS TO BE ADDRESSED

One of the issues facing design research training is traditional grouping of design research areas within the cluster comprising the Creative Arts category [25], which, while this has now been changed, nevertheless has muddied the water. The consequence of this is that the types of knowledge that may contribute to innovation in commercial, education and productivity realms become framed as artistic endeavours rather than as design undertakings. Named and framed as a branch of Creative Arts militates against the sorts of developments in design research training that other policy areas stress as important for productive developments in the field.

The argument that design is a discrete discipline with its own forms of knowledge production and articulation [26] is contentious within the visual arts and design communities which means that there is also contention about what constitutes design education and design research. What is agreed is that a key feature of design is the dynamic relationship between intellectual and manual skills, what Kimbell [27] terms 'thought-in-action' (p. 12) A number of definitions of design try to reflect this [28]. As noted by Norman [29]: "[D]esign can serve as a framework and catalyst for teaching and learning strategies that promote innovative, high end thinking, cooperative teamwork, and authentic, performance assessment" (p. 90).

If we take up the idea that design is a separate discipline to art and engineering and as such develops skills particular to design this does not mean that other disciplines preclude the working of interdisciplinary knowledge, skills and creativity. Who would argue, for example, that science is not a creative discipline? By the same token, who would argue that education is not creative? Creativity is not the province of design alone, but there is a creativity associated with design that does just as Norman [29] suggests.

While there is a debate about what constitutes design, there are some basic principles that have found agreement within the literature. These are expressed in the following: "Design often involves visualising something that has not existed before, so design is very much part of creativity. Design goes much beyond the 'look' of a product (its physical appearance). Good design will also shape the product for ease of use, reliability and costs of production and maintenance. Decisions made during the design phase will affect the quality and ease of manufacture of the product. For services, design can also affect how customers will experience a service, such as a bank or a fast food restaurant, including their experience in the queue. Elements of design, particularly graphic design, will form part of product, service and company branding and advertising strategy" [30, pp. 6-7].

We note that such discussions encapsulate some of the debates in the field since early this century, but we note also that they have not gone anywhere, as there has been no take up of the possibilities that they have opened up for research training in design. One of the reasons for this is the relative lack of theorists in the field of design research training leaves unquestioned the relevance of conventional practices of design that are premised on only tangentially relevant art, science and information technology models. The work of Paechter [31] highlights ways in which teachers' prior knowledge and perceptions influence the way they define and implement design in schools. We see this as being carried over into universities. These are considerations which have consistently emerged from the literature over time, and they are important because the values brought to the definitions of design will influence both the definition and the pedagogy of what is taught. Given the controversies surrounding attempts to define the field of design itself, there are important considerations not only for teaching and learning of undergraduates but also in research training for postgraduates. It would appear, then, that Faculties and Schools of Design in universities have a challenge to be engaged, and with some urgency.

IV. POSSIBILITIES TO BE EXPLORED

We suggest a number of possibilities to be explored. An important first step is the undertaking of rigorous research that starts with an examination of outcomes submitted by doctoral students in design. Our reviews of a number of design doctoral theses suggest that neither the students nor their supervisors have a clear idea of what research itself is. The tendency is to rely on what they consider to be self-evident in the artefacts that they put up for consideration, without exploring the research bases for what they have produced. Alongside this, we suggest explorations of public statements of a number of university design faculties, schools and departments internationally to identify the underpinning rationales for their programs, and submitting these to discursive analysis to identify just what it is that informs their doctoral programs. We would also see that evaluation of data from research and reports in the field would serve to inform future activities in design research.

Our claim that the lack of doctoral qualified graduates is a matter of particular concern to the design field is based on the work of Durling, Friedman and Gutherson [32] who also suggest that the relatively recent appearance of academic research in design is to be taken into account. The historic reliance on guild models for developing the skills and dispositions of design practice, coupled with an anachronistic positioning of Honours degrees in design as an opportunity for artistic experimentation or vocational enrichment has seen Honours programs focused on aesthetic and crafts-based skills that are not capable of addressing the needs of universities and industry research in the 21st century. The concept of specific design research programs is in its infancy. Neither the principles of design nor those of research have been easily or unproblematically transferred to the area of design.

Australia's case is not an isolated one, for Government indicators from around the world suggest Design's importance for economic development and growth [28]. The UK's Department of Trade and Industry (DTI) [30] describes the impact of the design sector as generating approximately £630 million of exports in 2003. Bruce and Daly [28] note an international trend towards increasing numbers of students studying design. We argue, though, that increasing numbers of students alone does not meet the calls from government and business for quality designers. While quality design research is a major consideration for government and institutions themselves, we argue that the quality of design research training matters, and that the way to get that quality is through quality design research environments. This is the area which we have identified as a major concern to be addressed by universities themselves, positioning this role in the context of wider concerns about research training itself.

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