The role of Honours in promoting research literate graduates for, and with, industry.

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ABSTRACT
The paper reports on a program that brings together what is known about active learning in design education, that is, learning by doing, and what is known about communities of practice to address a real concern – the lack of take up of Higher Degree by Research programs within the discipline of design. The report Building Australia’s Research Capacity Report (2008) 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. This paper focuses on the role of honours programs as serving two purposes: first to increase the numbers of undergraduate students taking up Higher Degree by Research programs as a way of increasing the numbers of doctoral qualified workers, and second, to produce research literate honours graduates for industry. At the same time literature around research training identifies the vagaries associated with research (Barron & Zeegers, 2002) as one of the barriers faced by Higher Degree by Research students in their research training. This paper looks to understandings generated through communities of practice and Legitimate Peripheral Participation to argue for a model of honours and Higher Degree by Research training that address such vagaries. The model uses collaboration and working with industry and researchers to establish Active Learning experiences—participants with various levels of research expertise working alongside each other in research clusters on industry projects to experience how methods are employed and problems are addressed and solved. The model argues for a staged, deliberate process of drawing newcomers into a given professional field, where they work with increasingly more experienced practitioners as part of specific communities of practice until they themselves become proficient.

INTRODUCTION
This paper reports on a program that brings together what is known about active learning in design education, that is, learning by doing, and what is known about communities of practice to address a real concern – the lack of take up of Higher Degree by Research (HDR) programs within the discipline of design. It is a case study of a program designed and implemented within a Faculty of Design at an Australian university. We have drawn on the work of (Kirschner, Sweller, & Clark, 2006) in relation to active learning and the role of direct instruction in teaching and learning. ‘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). In doing so, 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.

One aspect of the program is that it draws on higher degree research students to be teachers of honours students. Higher degree research students work alongside final year undergraduate students on projects that harness their particular research expertise and research training in general. This enhances the research training program of these higher degree research students by extending their mastery of their knowledge domain as they organise and articulate their knowledge of research and reflect on what they teach as they reply to questions from honours students. That is, as they teach the final year students the research students will engage those indeterminate zones of practice (Schön, 1987) in research training as part of their own development as researchers. At the same time they are supervised by experienced researchers within the Faculty. These supervisors have taken up methods of supervisory practice that represent a shift from a master and apprentice model to those related to establishing and maintaining communities of practice that use direct instructional guidance rather than rely on osmosis (see for example Barron & Zeegers, 2002; Cullen, Pearson, Saha, & Spear, 1994; Sinclair, 2004).

Honours students will experience systematic and orchestrated research training programs alongside their deliberate and orchestrated exposure to observed practices of research students. In this model, experienced researcher supervisors engage in teaching honours design students in formal and
explicit ways the protocols and practices of research. These supervisors also work with higher degree research students to develop teaching strategies to facilitate shared conceptual frameworks for research and research training. We anticipate that the sort of learning to emerge to be characterised as a change in long-term memory (Kirschner et al., 2006) that will serve research students in years to come.

Barron & Zeegers (2001, 2002) have argued 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 research outcomes. Given the competition for scholarships to undertake higher degrees and 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 a similar vein, academia and industry have the right to expect that an attribute of any graduate from a research training program will be systematic enquiry skills. The competing demands of academia and industry have been highlighted as a problem in the report Building Australia’s Research Capacity (The Parliament of the Commonwealth of Australia, 2008), which states: ‘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). This 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 (2008), the 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’ 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.

I. RESEARCH UNDER THE SPOTLIGHT

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 (Parliament of Australia, 2008; Carr, 2008, Sinclair, 2004). The research literature concentrates on good supervisory practice for research training (Ah Chung Tsoi, 2005; Arambewela, 2003; Australian Vice Chancellors Committee, 2002; Barron & Zeegers, 2005; Bartlett & Mercer, 2001a, 2001b; Grant, 2003; Manadunga, 2005; Nelson, 2003; Zeegers & Barron, 2008a, 2008b). The majority of the literature focuses on higher research degrees, rather than on the research-teaching nexus in the undergraduate degrees that are traditionally undertaken by students as a pathway to research. Zeegers and Barron (2008b, 2008c) have identified an apparent inattention to pre-HDR programs, a neglect that addressed by the Parliamentary Enquiry of 2008 into Australia’s research capabilities.

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. This project accepts the need to increase HDR completion rates; one of its features is designed to do just that. 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 at the honours level. Such grounding is needed to adequately develop research literate workers for academia and industry. We argue that it is not just a matter of waiting for more doctoral candidates to graduate; a research literate and skilled honours student can contribute to the research efforts of industry, or establish their academic career, or both. Indeed, graduates may enter and re-enter industry and academia as their careers develop in response to the research needs of either or both.

Zeegers and Barron (2008) argue that honours policies dating from mid-20th century are inadequate to addressing successful research training in general and to issues of research training in the in the design field in particular. The conference Doctoral Education in Design: Foundations for the future, held in France in 2000, addressed how research in the Design field could move forward as well as the inhibitors to such progress as far as the provision of doctoral degrees in Design was concerned. One of the main issues to emerge for the project team from an examination of the literature was that the provision of doctoral degrees in Design was based on a tangential connection of Design to either art or engineering. The program we describe in this paper focuses on the particularities of Design research education, within a framework of coherences where coherences are classed as synthesized, progressive and non-cohesive in published research outputs (see Golden-Biddle and Lock 1997). In order for us to understand how the peculiarities of Design might be addressed in the program we have developed and are currently implementing we explored a number of examinable outcomes submitted by doctoral students in Design, as well as the public statements of a number of university Design faculties, schools and departments internationally. It is beyond the scope of this paper to evaluate a program still undergoing its initial implementation; subsequent papers will take up areas of evaluation as relevant data become available.

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 (2003) who also suggest that the relatively recent appearance of academic research in Design must be taken into account. The historic reliance on guild models for developing the skills and dispositions of design practice, coupled with 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. At the
same time, literature around research training identifies one of the barriers faced by HDR students in their research training as the vagaries associated with research itself (Barron & Zeegers, 2002).

The problem we have addressed is thus one of aligning current Design education programs with the research expectations of a 21st century university and a range of industries and social fields that use Design. In this, we have looked to understandings generated through communities of practice and Legitimate Peripheral Participation (LPP) (Lave & Wenger, 1994) to argue for an integrated model of honours and HDR training to facilitate such alignment.

II. THE PROGRAM

The project uses an action learning methodology and research cycle, combined with a structured learning approach to research training program development. The participants have identified the main issues to be addressed through the review of relevant literature and institutional grey data. The action cycle is iterative; there will be back and forth exchange between the various participants and the data so that all decisions can be verified. For purposes of the review, published literature has been defined as anything with an ISBN or ISSN number. Grey data is information in the public domain, but without an ISBN or ISSN number or with limited distribution, such as that distributed within an institution, organisation or network.

The iterative process between stakeholders in all phases of the program’s development and delivery is critical to its success. All stakeholders, for example, have been included in the development of the project vision and plan. Key stakeholders are the students, staff of the Faculty, and an external education expert. The students are honours and HDR cohorts, who represent the next generation of researchers in Australian academia and industry. Their research training needs sit at the heart of the program, as does the objective of enhancing Australia’s research capabilities. The staff are research active and general academic staff. The general academic staff facilitate and administer the program, while the research active academics deliver generic research methods and conventions, as well as Design-specific research skills. Qualified research supervisors are responsible for the supervision of the HDR students, who in turn work with Design honours students. An education expert from an external institution acts as a sounding board and education advisor to the program.

The program has participants with various levels of research expertise working with industry and researchers to establish active learning experiences as suggested by Kirschner et al., (2006). The activities take place within the Faculty research clusters working on industry projects. This allows less knowledgeable participants to gain direct experience of using appropriate methods of enquiry to address and solve problems. The program presents a staged, deliberate process of drawing newcomers into a professional field, working in a supported environment under the guidance of professionals with increasingly greater levels of experience enabling them to become proficient, the research clusters are constituted as specific communities of practice and thus drawing on the concept of LPP. Fundamental to the program is the focus on demystifying research, not only the processes of research but also the culture. This is achieved through direct institutional instruction and active learning through experience.

Direct instructional guidance is undertaken by experienced academics. This takes the form of a guided unit of study which is undertaken in conjunction with project work. This component develops knowledge and strategies for information seeking, critical appraisal of research sources, and methods for framing design research projects through text and visual material. It incorporates a program of guided research training to assist candidates in framing a research question by establishing what is and is not known about an area of design-related inquiry, areas of controversy or limitation in the field, and appropriate research methods. It gives an overview of research related topics such as intellectual property considerations, research policies and procedures and project planning. This includes the composition skills needed to effectively incorporate references from a range of sources, the language expressions that show the critical evaluation of sources, and the conventions of academic writing. Practice of oral presentations and the opportunity to explore design-related matters in conversation will also be included.

Learning through experience harnesses the developing knowledge and skills of HDR students to teach honours students. Honours and HDR students are intellectually positioned at different stages of their research learning and experience, engaging at different levels with the totality of what it is to conduct research from well known and documented formal requirements to less known, documented, often unexpected, dimensions of a research culture and experience. The program, then, is multi-layered, in enabling novice participants to see the progression through which one acquires skills and experience in the practice of research as mirrored in the activities and knowledge of a sequence of more experienced researchers collaborating in the research clusters.

We note here that the program is delivered in the context of established research clusters that focus on a specific Design research method or research problem. The academics within these clusters already supervise a number of HDR students at various stages of completion, with panel supervision already featuring as part of the protocols of the clusters. Building on this established framework, our project goes a step further in bringing students into the clusters that engage with research problems that have emerged from professional and industry practice, rather than being artificially constructed as is typical with honours projects, especially those formulated as an individual dissertation (see Tynan and New 2009:297).

The literature indicates more than 10,000 published papers on teaching and learning programs where the research draws on the work of Lave and Wenger (1994) and their conceptualisations of Legitimate Peripheral Participation (LPP). The research training program described here is based
on the practical application of theorisations of communities of practice and supported by teaching and learning frameworks developed with, by and for supervisors, their students and other relevant teaching staff. To monitor the program’s success, it is anticipated that the project will extend to an alumni program designed to track the career path of honours students who have taken part in the program for a minimum of five years after graduation.

The program endorses the importance of including a significant research component in the final year of four year degrees, whether this takes the form of an honours year or a minor or major research thesis. This shift anticipates that a number of graduates of the program will go on to become leaders in industry research programs or in Design education. Research-based components in students’ final year programs are increasingly regarded as the initial entry level qualification for HDR undertakings within Higher Education settings internationally, in most Australian universities, and in research-based industry employment, whether this is within a formally constituted honours year according the 3 + 1 model or the last year of a four year vocational degree. A complication is the assumption that honours has a research component, but research has shown that this is not necessarily the case (see Zeegers & Barron, 2008b, 2008c). This fact alone has renewed national interest in how the university sector supports research training for its students.

CONCLUSIONS

Introducing a new program is risky in an environment where evaluation feedback by past graduates reveals a very high satisfaction with their studies and the general overall worth of the existing program. The rationale for this new program is the need to find alternative ways in which to, first, develop a research training program that complies with Research Training Scheme guidelines and their emphasis on research productivity, which includes the development of vibrant research cultures to support such productivity, and second develop pathways to research for graduates. These objectives are not new in Australian honours course (see Kiley, 2009) but this is the first instance in Australia of the development and delivery of a dedicated honours program offering comprehensive Design research training as a pathway into research and industry.

The project is timely for a number of reasons. Firstly, it coincides with national interest in bolstering research training and Australia’s research capabilities in higher education settings. Secondly, it provides a framework for addressing the challenges in research training and enhancing of Australia’s research capabilities posed for design disciplines within an institutional setting. Thirdly, it recognises the wider international agenda for improving research training and research capabilities in industry and education settings, opening up the opportunity for Australia to participate in that discussion. Finally, with the ageing of the academic population, the project recognises the importance of preparing a new academic workforce comprised of new academics aware of the sorts of collaboration required between research and research training, the higher education sector and industry.

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