

Designing Capacity: Broadening and Deepening Design Capacity through Design Education

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In this paper we canvass a shift in professional practice for teachers and teaching and learning as it focuses on Design Education. We acknowledge that changes in formal educational settings result from the scope and rapidity of changes in emerging technologies and understandings of pedagogical influences on teaching and learning. In canvassing the changes, in this paper we identify issues that emerge in relation a number of proposed solutions in dealing with gaps in teacher education in the field of Design Education. We suggest that these same solutions draw on traditional disciplines which ignore the possibilities of Design to engage 21st Century problems in teaching and learning. We draw attention to a neglect in current teacher education programs in relation to teachers of design and what this may imply for classrooms, teachers, and their work.

Introduction

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 Education is basic to such agendas. Given the articulations of government priorities we can anticipate that the demand for Design Education 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 pre-service teacher educators in appropriately designed teacher education programs.

The concept of specific Design Education programs, however, is in its infancy. Neither the principles of Design nor those of Education have been transferred to the area of Design Education. We argue for a transdisciplinary approach that will allow for the creation of world's best-practice in this area by combining expertise in Design and teaching and learning issues, industry needs, and national government proprieties in the field of Design.

Government Priorities

The policy environment of Design Education and related issues may be traced over a number of years, aligned with developments in school curricula and teacher education programs as providing a background to the discussion of Design teacher education. These priorities are evidenced by governments around the world focusing on Design as one way to increasing their industries' competitiveness in globalised markets. In Victoria, Australia, for example, ministerial statements point to the development of 'a clear understanding of [Design's] contribution to the economy', citing its contribution to economic activity being up to \$6.8 billion annually, with the sector employing around 67,000 people (Kosky, 2004). Dowrick's (2003) review of Science, Research

and Development and Productivity identifies Design as a priority area for development of innovation in the university sector. As he (Dowrick, 2003) states:

As goods, services and processes become more knowledge intensive, it is increasingly important for businesses and other organisations to be able to identify and use externally generated and multidisciplinary knowledge. To increase productivity, firms must be receptive to knowledge and able to use it. This requires them to have appropriate links, networks and internal capabilities for innovation (p.9).

Australia's case is not an isolated one, for Government indicators from around the world suggest Design's importance for economic development and growth (Bruce & Daly, 2005). The UK's Department of Trade and Industry (DTI) (DTI Economics, 2005) describes the impact of the design sector as generating approximately £630 million of exports in 2003. Bruce and Daly (2005) 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 education is a major consideration for government, we focus on those who would deliver the programs called for; we focus on the Design educators. The quality of Design education matters, certainly, but the way to get that quality Design education is through quality Design teachers; the way to get quality Design teachers is through quality Design Teacher Education. .

Conflicting policy statements generate complicating aspects to Design education. Policy statements such as those by Australia's Minister for Industry Innovation, Science and Research Carr (2008) suggest that Design is pivotal to innovation and economic productivity. At the same time, the grouping of Design research areas within the cluster comprising the Creative Arts category (Australian Bureau of Statistics, 2008) muddies the water. Design is thus sidelined within the broader field of Creative Arts. 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 mitigates against the sorts of developments in Design Education that other policy areas stress as important for productive developments in the field.

Design theorists have not reached agreement on what constitutes Design (Friedman, 2000):

Although the word, Design refers to process rather than product, it has become popular shorthand for designed artefacts. This shorthand covers meaningful artefacts as well as the merely fashionable or trendy. I will not use the word design to designate the outcome of the design process. The outcome of the design process may be a product or a service, it may be an artefact or a structure, but the outcome of the design process is not 'design' (p. 9)

In this paper we take up the position that has been outlined here. We go a step further to take up the idea of what a designer is, or might be: 'A designer is a thinker whose job it is to move from thought to action' (Friedman, 2000, p. 10).

School Curricula and Educational Programs

One of the most significant events in curriculum development and implementation in Victoria, Australia, alone is that of the Victorian Essential Learning Standards (VELS) (Victorian Curriculum and Assessment Authority, 2005). In its overview of the new curriculum that has been implemented in schools from Years Prep to 10 since 2006, it graphically represents what it calls one of three interwoven purposes under the heading, Interdisciplinary Learning (p. 6) as ‘Knowledge, skills and behaviours in Communications; Design, Creativity and Technology; Information and Communications Technology; Thinking’. Here, Design, Creativity and Technology are related, and Design is conflated with the other two. It does not form a Discipline-Based Learning Strand as the Arts, English, Humanities (where Economics, Geography and History are positioned), Mathematics or Science do. What this suggests is that teachers take up the sorts of creative opportunities that Design might provide, but it does not give it the status of a discipline that may be studied in systematic and valued ways as other discipline-based learning is. In the years preceding 2005, various State and Federal government ministers advocated the inclusion of Design skills in education, and supported that advocacy with budgetary allocations to be accessed by universities to facilitate the development of Design foci in disciplines to be taken up in educational institutions including schools and tertiary contexts (Nelson & Coonan, 2004). In spite of this, the attendant curriculum advancement that would be required for the actualisation of these ministers’ calls has not been supported by schools-based curriculum requirements that would inform pre-service teacher education.

Schools throughout Australia and other countries (Rasinen, 2003) are now required to address a full range of employment and career possibilities, but to date efforts in relation to integration of Design within educational programs have largely been focused on enabling work experience for teachers and children to industry placements rather than providing opportunities for the participation of potential Design teachers in the full range of educational and industry experiences in Design. Teachers therefore rarely experience systematic, well grounded professional programs and miss out on opportunities for their own professional development. Again, we refer to the literature which calls for further research into the ways that Design Education may be enhanced and expanded. If we are to take up the calls for appropriate Design curriculum and teaching that might be developed in teacher education programs then we need to identify salient aspects of Design-specific knowledge and ways in which Education teaching and learning theory and practice may work with these.

A key feature of Design is the dynamic relationship between intellectual and manual skills, what Kimbell (1995) terms ‘thought-in-action’ (p. 12) A number of definitions of Design try to reflect this (Bruce & Daly, 2005). As noted by Norman (2000):

...[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 as a separate discipline in the skills to which refers may be developed, this does not 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 (2000) suggests.

While there is a great deal of debate about what constitutes design, there are some basic principles that have found agreement within the literature. These are expressed as follows:

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 (DTI Economics, 2005, pp 6-7).

Transdisciplinary Approaches

A further complicating factor is the ways in which Design is currently offered in schools. A report into Design provision in Victorian state secondary schools (Anderson, Jackson & Barron, 2004) indicates the trend towards teaching Design under the rubrics of Information Technology, Engineering and Art. At the same time there is a reliance on teachers trained to teach Art to deliver the curriculum in this area. This is at odds with theorisation of Design as a separate teaching and learning domain. Potential teachers of Design can at present develop compensatory strategies, drawing on existing Art, Science and Technology scholarship and practice, but not in any systematic and effective manner. The work of Ginns, Norton and Davis (2005) has explored a number of issues that impede and facilitate teacher approaches to Design and the strategies that they develop in classroom environments. They also argue that current practice is to call upon Art teachers to design and implement school programs in Design. This results in a bias towards creativity in Design, but tends to neglect the role of innovation and technical expertise in such programs. It is in effect a state of making do with what is available; it is not a case of making best practice happen.

Current curriculum is premised on only tangentially relevant Art, Science and Technology models. Current teaching practice is to call upon Art teachers to design and implement school programs in Design, which results in a bias towards creativity in design, certainly, but tends to neglect the role of innovation and technical expertise in such programs. It is in effect a state of making do with what is available; it is not a case of making best practice happen (see for example Anderson et al., 2004). We argue for the design of a set of protocols and models for best practice, benchmarked against national and international standards, underpinned by quality research that incorporates areas of expertise in Design, and in Teacher Education. We propose that the development and delivery of appropriate Design Education may be achieved through transdisciplinary approaches that draw upon resources and expertise of university offerings in Education and Design, which would exploit synergies between the two. The current lack of Design in teacher education programs means that the potential benefits of linking industrial and cross-disciplinary educational expertise and

experience in Design Education is not explored, which further means that the potential of teachers with an interest in developing expertise in Design is impaired. In similar vein, designers who become knowledgeable in the educational possibilities of teaching and learning in Design will be better informed as they are positioned as educators in the tertiary sector as the field opens up for them.

While there is a number of tertiary education institutions that offer degrees in Design, these are focused on the education of designers for industry and commerce. None is specifically designed for the requirements of Design teachers in schools. This highlights a gap in teacher education programs that could be developed to meet this shortcoming. Our argument is for the mobilisation of expertise in Design and in Education to create programs that currently do not exist anywhere in the world. We argue that such creations will allow a more systemic address of issues that have been raised over a number of years in Australia and elsewhere (Anderson et al., 2004; Bruce & Daly, 2005; Kosky, 2004).

This literature is of some importance to the conceptualisations underpinning our proposition in that it has identified the need for specialised education programs for Design academics and teachers. We note that they encapsulate some of the discussions and 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 teacher education.

The Lack of Theory

The relative lack of theorists in the field of Design Education studies leaves unquestioned the relevance of those conventional practices of Design Education premised on Art, Science and Information Technology models. Science Education, for example, relies on a model of practice that is quite at odds with the aims of Design Education (Gibson, 1993; Harrison, 1994; Lewis and Gagel 1992). The style and scope of Design classes can also be heavily influenced by the teacher's subject background (Barak, Eisenberg, & Harel, 1995; Rennie, Treagust, & Kinnear, 1992), the latter authors also commenting on the narrow view of Design held by teachers of Science. The work of Paechter (1992) highlights ways in which teachers' prior knowledge and perceptions influence the way they define and implement Design Education.

In a study of Swedish teachers implementing a Design program, Lindblad (1990) has found that the teachers had to rely, in the absence of understanding of what the subject was, on their own personal experiences. Medway (1989) also notes that until there is the development of a taxonomy of Design manifestations in schools, the educational outcomes of the subject will be determined in part by the *ad hoc* enthusiasms of teachers.

These are considerations which have consistently emerged from the literature over time, and they are important because, as noted by Lewis (1991), the values brought to the definitions of Design will 'influence the way its content is defined, what goes in the curriculum, and how the subject is taught' (p. 144).

The current lack of clarity in Design Education and what this means for pre-service teacher education programs that might be developed in the future (see Lewis, 2004) means that the potential benefits of linking industrial and cross-disciplinary

educational expertise and experience in Design Education are not fully realised. No teacher education program in Design currently exists in either name or remit. One might expect that with the number of various government policies and attendant funding that has focused on the development of Design capabilities that this would not be the case. Nonetheless, it is the case.

The establishment of such a program or programs has significance beyond individual nations' requirements. It has the potential to be a focal point for coursework and pathways to research in postgraduate Design Education around the world, engaging all Design stakeholders in building nations' Design capabilities. We argue that a theoretical approach to Design Education would inform the establishment of such programs, shape the protocols for their implementation and delivery, and ensure that they are designed and built to meet the needs of potential Design educators from the outset rather than making adaptations later to suit particular needs. In short, we argue for a Boyer (1990) scholarly approach to the resolution of the problems that we have identified. That is, we argue for research-based program development and teaching.

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