

Educating Those involved in Changing Human Futures: A More Coherent Program For Design Education

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Abstract

Designing is an ubiquitously essential part of all human endeavours and human futures, and, in this sense, one of the more important elements of professional education in human societies today.

Worldwide, however, design education is very fragmented in its traditions and its various modalities. This paper argues for a radical review of the way that all those involved in designing are educated, and suggests a return to first principles, a re-exploration of the role of designing in human activities, to build a more effective and coherent education for those involved in designing the systems, processes and artefacts that contribute to the shaping of human futures.

To this end, the paper explores some key conceptual considerations in embarking on this task, and draws on these conceptual structures to suggest improvements for design education, and implications for design research.

Introduction

This paper focuses on one of the primary roles of designing: improving human futures. Designing has this key role because every planned change that impacts on human futures involves an act of designing (Dorsa & Walker, 1999; Jones, 1970; Love, 1998b; Papanek, 1984) . The paper explores how design education might support designers in fulfilling this role. This *human futures* perspective on designing brings an emphasis on the ways that the *social*, *ethical* and *environmental* effects of designed artefacts form the core of functionality of designs (Love, 1998a) :

- *Social effects* because designing is an essentially human activity and its outcomes are aimed at creating changes for individuals and societies.
- *Ethical effects* because designers make choices about good/bad, include/exclude, do/don't do, etc. All these choices depend on human values and hence lie in the realm of ethics.
- *Environmental effects* because all designing is intended to change human environments. If designed artefacts did not do this then they would be literally useless. Problems of adverse side effects of designs are a secondary aspect of the environmental effects of designing.

The most obvious characteristic of design education in this context is its fragmentation of approaches, content, methods and practices: segmentation driven by disciplinary and professional demarcations. The picture that emerges is that design education has developed in

an uncoordinated manner divided by the organisational, cultural, theoretical and praxical priorities of single disciplines (Giard, 1999; Kimbell, Saxton, & Miller, 1999) .

Until recently, design education that emphasised the contribution of *making skills* in the arts and crafts traditions was mainly provided by colleges outside the university context (Kimbell et al., 1999). Universities provide more theoretical kinds of design education, mainly within the framework of courses whose primary foci are the use of abstract concepts, analysis and theoretical models - for example, engineering design education is subsumed within the discipline of Engineering, whose focus is on mathematical models of physical phenomena.

The cultural differences between the above two categories of design education, *art and craft* and *theory*, were not problematic whilst the forms of education were educationally and professionally separated and not directly compared. In recent years, however, restructuring of tertiary education systems has led to many design education courses from *arts and crafts* traditions becoming part of university curricula. This has resulted in an intense dialogue between design educationalists, researchers, theorists and practitioners about the most appropriate changes to be made so that *art and craft* design courses can best align with university culture (see, for example, Durling & Friedman, 2000). This dialogue and debate is useful because it has started to make explicit the detail of theoretical and epistemological issues that separate the *art and craft* and *theory* cultures of design education, and defining the articulation between design education and the other disciplines that are involved in the education of designers.

The picture that is emerging from the debate is of a weakness in the development of epistemological, ontological, conceptual, theoretical and terminological coordination across the fields of design education (Love, 1998a) . This aligns with the analyses of design researchers who argue that the lack of multi-disciplinary coordination limits in many ways the quality of outcomes and the contributions that designers can make to improving human futures (see, for example, Byrne, 1989; Coyne & Snodgrass, 1992; Harrison, 1987; National Crime Prevention, 1999; Papanek, 1984; Willoughby, 1990) . The main underlying problems that appear in the literature are:

- The primary educational content of design education programs is focused on, and generally limited to, the knowledge base of the discipline within which the design education is provided.
- The ontological, epistemological and theoretical foundations of design education are different for different disciplines.
- There is little agreement across the field of design education about key concepts relating to designing, design theory and design research.
- The disciplinary-based focus of most individual designers means that they are not well trained for addressing the multi-disciplinary issues that shape human futures.
- There are few common conceptual, theoretical, analytical and terminological modes of communication between designers from different disciplines.
- The discipline-based focus of design education limits the amount that designers can be educated to be able to understand and draw on the theories, analyses and findings of researchers in other disciplines.

Some design researchers have started to map out the multi-disciplinary relationships between the contributions from different disciplines (see, for example, Konda, Monarch, Sargent, & Subrahmanian, 1992; Reich, 1994a; Reich, 1994b; Ullman, 1992) yet there have been few attempts to explore the broader implications for design education. The most common educational response has been to add small amounts from other disciplines to what are otherwise single disciplinary courses. For example, engineering design courses include units on *the engineer in society* and *engineering ethics*. Graphics design courses include units on

contextual issues. In most cases, these extra-disciplinary courses are usually a small fraction of the overall educational load and at an introductory level (Bullock & Justice, 1999). The educational outcomes are specialist designers who have basic information about the existence of other fields and, perhaps, a surface knowledge of the main issues in those fields. These current approaches to design education do not offer any obvious pathways to educating designers competent in working collaboratively to address the complexity of multi-disciplinary detail necessary to contributing effectively to designing improved human futures. That is, designers who *have a similar level of understanding of a tertiary qualified practitioner* in the variety of disciplines associated with the complex of issues that need to be addressed in understanding the futures implications of designing and designs.

The evidence suggests that the above difficulties are caused by the way that design education has developed and delivered via individual disciplines. Addressing these problems requires an understanding of who is involved in designing human futures, and increased clarity about which elements of designing are common across disciplines and which are discipline-specific.

Designers of Human Futures

There are many individuals who shape human futures by designing:

- Designers focusing mainly on visual outcomes and surfaces
- Technical designers involved in engineering, software creation, systems, information management, architecture etc.
- 'Other' professional designers, involved in, for example, education program designing, organisational structures designing, and other design modalities in the areas of for example, policies, behaviours, lifestyle, agriculture, management, economics, business, commerce, government etc.
- All human beings who undertake the myriad of often hidden design acts, small and large, that help define and shape possible human futures.

From this perspective, designing is not solely a professional activity; shaped only by existing courses of design education. Many who do not have *design* as part of their job title are involved in designing human futures in one form or another. Many professional designers have followed educational pathways outside what is or was currently formalised as design education, and many individuals educated as designers are applying their skills in occupations outside the currently recognised design fields. These considerations imply that an education in designing is an important aspect of the education of all humans, not only those who earn their income through professional designing.

The Activity of Designing

Underlying contemporary discussions of designing and design education is a lack of agreement about the nature of designing (often referred to as *design* or *design process*) (Chung & Whitefield, 1999; Love, 1998a) . For the purpose of establishing suitable foundations for design education it is important to identify which human activities are *designing* and which activities need unbundling from it.

One test of whether two activities, X and Y are conceptually similar enough to be addressed as the same entity consists of three questions:

1. Do X and Y occur together?
2. Can X occur without Y?
3. Can Y occur without X?

If the answer to the first question is Yes, and the answers to the second and third questions are No then there is a case to conceptualise X and Y together. If, however, the answer to the first question is No, or the answers to either the second or the third questions is Yes, then X and Y are best addressed as separate concepts.

Let *designing* be X, and *engineering analysis* be Y. In this case, the answers to the above questions are Yes, Yes and Yes. These answers indicate that *designing* and *engineering analysis* are best addressed as separate concepts because designing can occur without engineering analysis and engineers can undertake analyses when they are not designing.

The same method indicates that designing and drawing are best addressed as different concepts. There are forms of designing that may not of necessity involve drawing, e.g. software designing, engineering designing, organisational designing, informatic designing. Similarly, many forms of drawing, from the mundane to the sublime are not designing because they are not intended to produce a specification for the construction of an artefact or a plan for further action, a criteria for a *design*. This means that there is a strong epistemological case for addressing them as separate concepts. Replacing the term *engineering analysis* with most of the other activities and bodies of knowledge associated with designing gives similar results implying that, in epistemological terms, they are better viewed as distinct from the activity of *designing*.

Two possible exceptions are 'thinking' and 'feeling'. Thinking is widely regarded as a key aspect of designing yet there are several reasons to be cautious of this assertion. First, recent protocol analyses of practicing designers indicates that designing often occurs without passing through designers' conscious modalities of cognition. That is, conscious thinking is not a prerequisite for designing. Second, is the difference between the human activity of *designing*, and the *thinking* in the domains associated with intended design outputs, that is associated with and supports, but is not the same as, the *designing*. Third, it is unclear whether individuals' designing *must* depend on subconscious thinking of the rational sort made explicit by cognitive science. Many designers claim that they 'feel' their way towards solutions, and the use of reflection in design practice only implies that tacit modes of designing are caused by subconscious thinking if it is assumed that subconscious thinking is the only possible mechanism for tacit functioning. Together these imply that the concept and term 'design thinking' may be an unfortunate, unnecessary and potentially problematic conflation. Further work remains in this area, and whilst uncertainty remains, an epistemological distinction should be made between the concepts of 'designing' and 'thinking'. Whether the designing related thinking processes should best be viewed as human internal data collection processes, or modes of communication, or aides-memoir may depend on the exact details of an individual's activity on a moment to moment basis.

Feeling mechanisms, analysed by Bastick and some cyberneticists, have a very different relationship to designing. Feelings are associated with an intention of further action, and the reflexive relationship of feelings with cognitive constructs that Bastick identified implies that they are deeply involved with any *plan* for further action, that is, the creation of a *design* - either internally held or externally explicit. In addition, the role of feelings in closure suggest that it may be impossible for *any* designing to occur without feeling processes (Love, 2000 (in press)) . In the limit, the relationship between the development of an internal 'design' as a specification for action, feelings, and external experiences is very close to the Taoist 'Wu-wei' or 'action without action'. At a more prosaic level, it implies that, conceptually, internal activities of 'designing' and 'feeling' are more closely related than designing and thinking. These factors imply that understanding, and managing, human feeling mechanisms and their relationships to internal and external human states and processes are core aspects of design education and theory-making about designing and designs. They also indicate that individual constructivism is a key theoretical perspective for a coherent form of design education (Love, 1998a; Oxman, 1999) .

Design Education and Human Futures

Currently, professional designers are taught three ways of preparing for designing:

- Identifying users' wants/needs - in order to create designs of artefacts that will fulfil those wants/needs.
- Researching markets to identify trends to design products that will be commercially successful.
- Striking out in a new direction and creating designs that form their own market by creating designs that are new and innovative, and may shock or surprise customers. An example of this third approach is the production of the Sony Walkman, which was apparently created independently of any market research.

From the perspective of creating improvements to human futures, the above three approaches are limited in several ways. First, the discipline-based compartmentalisation of design education, and design professions means that they are implemented within the conceptual confines of disciplines. For example, engineering designers mainly explore user's engineering needs, graphic designers focus on visual characteristics, and organisational designers focus on organisational issues. Second, commercial considerations drive the ways that they are undertaken. Third, the foci of the above methods is on the present and immediate futures (the small area of *Designing for Sustainability* being an exception). The main purpose of the above three methods is to bound the solution spaces in which possible designs may be found to reduce complexity and aid the identification of designs for products that are likely to be financially successful as soon as possible. Improving human futures requires a broader perspective than found in the above approaches to designing. Educating designers to undertake their roles in improving human futures requires designers and design educators to appreciate that:

- Designed artefacts shape human futures in both the short and long term.
- Improving human futures is one of the primary aspects of designing and design education.
- Designers have responsibilities as a consequence of the influence that they have on the development of individuals and societies.
- Researchers in Futures Studies have already undertaken a substantial amount of work in how designed artefacts shape individuals' and societies' futures.

The above analyses suggest that improving human futures is adversely impacted by:

- The current discipline-based aims and pedagogies of design education and design practices,
- Assumptions that designing is only undertaken by discipline-based categories of design professional.
- Conceptualising the activity of designing in terms of associated discipline-based skills.

Fully supporting the roles of designing and design education in improving human futures requires more than is provided by current modes of design education. How much more is unclear. The analyses presented earlier suggest that effective designing to improve human futures is likely to:

- Be undertaken by multi-disciplinary designers who are able to analyse and utilise the findings of many disciplines at a similar level to professionals in those disciplines.
- Involve wide-reaching analyses of the factors that impact on designing and the broader effects of designed artefacts, particularly in the social, ethical and environmental realms.
- Be grounded in Futures Studies methodologies, analyses, and projections.

- Include the designing activities of all persons involved in designing the future, whether professionally employed or not.

For design research, and theory making about designing, the analyses presented in this paper suggest a radical change towards defining the concept of designing as a primary human activity independent of the other activities with which it has previously been associated. Separating the activity of designing from associated activities is useful on several fronts because it clarifies many issues about who is designing, what skills they need and, what education may be most appropriate. This opens up research avenues to make explicit the detail of different aspects of human functioning that have been hidden by the conflation of designing and other activities. New possibilities for research include exploring how humans bring together this domain-free activity of designing with other activities such as drawing, calculating, reading, looking, and talking, and exploring how the attributes of the activity of designing are shaped by past experiences and physiology.

For design education, the separation of designing from discipline-based activities argued for earlier has several implications. First, it offers the possibility of extending the teaching of designing into most disciplines, including those not previously associated with designing. Second, it clarifies (and in some cases resolves) many difficult cross-disciplinary conceptual conflicts in disciplines educating designers in discipline-based skills. Third, it offers the possibility of a course in designing broadly aimed at improving the internal functioning of any individuals' cognito-affective designing processes. Such a course could be independent of domains, disciplines, or product types. Finally, it suggests that a substantial support course in design education is necessary that trains individual designers to be able to analyse and utilise the theories and findings of research in a wide range of disciplines at a similar level to professionals in those disciplines.

Summary

This paper has explored improving the designing of human futures by defining designing as an activity separate from other domain and discipline-based activities, and exploring the adverse impacts of current modes of discipline-based design education. Suggestions have been made for changing some of the foundations of designing, design theory-making, design research and design education to facilitate designers in taking up their responsibilities improving human futures.

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