Creative Collaborations

Thomas Kvan
Dean and Professor
of Designed Environments
Faculty of Architecture
University of Sydney, NSW 2006, Australia
tkvan@usyd.edu.au

The teaching of design is typically an individual process. Theories of learning, imperatives of assessment and traditional teaching models set individual tasks that are intended to lead to individual submissions. With attitudes of training and instruction, the focus is typically on skill acquisition and demonstration of such skills through successful completion of project tasks. The context of studio teaching, however, is one that is immensely powerful and makes a substantial contribution to the intellectual approaches to comprehending our realities and, more importantly, our futures (1996). In this paper I will focus on three aspects of studio that warrant attention, among the many that demand it, especially as digital media and environments, beyond tools, are pervasive in design. This paper will consider the importance of studio education as the context for design education from the aspects of design as a social act, design as an expert act, design as an engagement of data.

Studio, the essential context

Design studios are central to the concept of fostering creativity. The studios enable students to establish environments of peer learning to complement the tutor led instruction. The distinctiveness of studio teaching has been well documented, most often references is the perspective of Donald Schön, who draws upon the architectural experience to describe it. In other fields, the value of studio education is being recognised. For example, in engineering studio is now being used, although in a diverse manner. A definition of studio provided in engineering illuminates the difference with other modes of teaching: "...a general approach to interaction with students that is instructor facilitated, student centered, and very hands on." (Little and Cardenas 2001)

The concept of studio is nowhere as well developed as in architecture. In this discipline, the studio is not only a way of teaching but also a mode of professional practice, and the educational environment can mirror that of practice in even the most exploratory exemplars of the profession. In architectural education, the studio is typically the locus of the experience although the extent to which it features can be quite diverse, from Total Studio curricula in which all learning is studio focused through to studio being limited as an engagement in only a few of the years of learning. In all cases, it is intended that studio exposes students to typically lengthy project based work on open ended problems, particularly ill formed and wicked problems (Churchman 1967); rapid iteration of design solutions (Lawson 1980); frequent formal and informal critique and juries (Anthony 1991); the use of precedent while engaging the parts and the whole (Lawson 1993); a creative engagement with constraints through reframing (Schön and Wiggins 1992) ; and the central importance of design media that examine the holistic problem from a number of representations (Schön 1992; Kvan, Wong et al. 2000). The aspects of social, expert and data engagements underlie all aspects of studio teaching.

Design: a social process

While an educational studio can mirror practice, the practice of design is distinct from this world of learning in one important dimension. As noted at the beginning of this paper, students are required usually to work on their own; in contrast, practicing designers are engaged in a constant process of exploration and negotiation, a context of working together, typically referred to as collaboration (Kvan 2000). This socialised

distinction between the worlds of practice and those of education is not unique to architectural education; Bucciarelli (2002), for example, notes the same distinction in engineering education.

The socialisation of novice designers is essential, in as far as design itself is a social engagement. By this, I do not reflect the superficial observation that the products of design are intended for use by society, although that is true, but rather that designers work in a complex environment of socialised languages, processes and frames of reference (Kvan and Kvan 1999). When students start to work in team contexts, not only dividing the work into subsets to be parcelled out but fundamentally team activities, the experience and outcomes change. For example, the process of framing changes in teams (Stumpf and McDonnell 2002) and successful participations are founded on individual competencies and expertise (Vera, Kvan et al. 1998).

Design: an expert act

In addition to a socialised context for design, I assume that design is an expert act; expert, that is as the term is understood in the discourse of cognitive science (Vera, Kvan et al. 1998) . The implication of this position is that design depends upon the acquisition of a substantial and significant body of knowledge, that this knowledge acts upon a body of data and that the process of acting is contingent on an ability to engage in tacit reasoning that derives from a lengthy engagement with the field. While some design or creative acts may be observed in novice designers, the ability to consistently demonstrate creativity is observed in the work of those who can be termed 'expert'. Expertise is developed through self-directed and repeated engagements with a range of situations; through rehearsal of approaches and arguments; development of a set of meta-strategies and well developed engagement with a basic set of skills(Eraut 1994). From this base, the expert professional develops continuously their deliberative strategies for solving quickly new and complex problems.

An expert model of design does not imply that the designer works through a well rehearsed set of design responses to given situations, what might be considered 'intuitive' approaches. Experts exhibit patterns of problem solving actions that trace well rehearsed strategies, but these strategies in experienced designers are

meta-strategies, perhaps the most fundamental of which has been termed 'reframing' (Schön 1984). Framing can be taken to work a number of levels. At the larger scale, framing can be understood as the 'structures of belief, perception and appreciation' (Schön and Rein 1994) or it can be modelled at the micro task level as that act in which the designer sees the problem as an opportunity for a new direction (Minsky 1977). At whichever level of definition, we can accept that an ability to reframe is a fundamental attribute of a designer. Distinct from technological approaches to innovation, such as those exhibited in science or engineering training, design in the creative fields distinctively exhibits this behaviour of reframing. In design training, therefore, we must expose students to framing and assist them to develop an appreciation of the skill.

Design: an engagement with data

As we work increasingly with digital tools, the potential is clearly not only as a means of representation. In analogue discourses, the role of data is not apparent unless brought to the fore explicitly. Inherent in the digital is the essential role of data, since all representations are data in themselves. The role of data can be implicit, as it is for most representation, but can be more interestingly extended to an explicit contribution in design, for example in parametric processes. As designer gain confidence in conversing (in the reflective sense) with their data, the designer takes on a more important contribution to the exploration. When students are exposed to such situations, their understanding of design changes and their confidence grows. No longer are they blindly grasping at tacit concepts, typical of the traditional studio learning process, now they see tangible connection between data and design outcomes. Learning to express their design concepts as manipulations of these data, the connection between design intent and outcomes is made explicit.

Futures for design learning

The paper explores three aspects of the studio experience. From these perspectives, it is important that design education offers student opportunities to participate in group processes in which they will engage. Given that design is an expert act, we need to support the development of skills to engage in expert collaborations. Taking a student from the position of a neophyte, tentative in their acts, develop their understanding of how design is informed by data and the

languages with which they understand their design. In this process and working with peers and the context of design, the student experiences the socialisation that fosters and supports creativity, thus learning the languages of design.

We must prepare students for working in teams. A team is not simply a sum of individuals; team processes depend upon the ability of the constituent individual to contribute in a number of dimensions, including knowledge, process, skills, organisation and social contributions. As society has evolved from nomadic through industrial to information economies, organisational forms have moved from tribes through bureaucracies to networked systems. We can observe that studios and the design process have changed similarly, affecting all levels of our work.

Access to data requires the capacity to manipulate and act on the data. A design education must engage the range of tools to equip students with the capacity to approach data from different assumptions. A curriculum needs to develop a variety of modes of engagement. It is in this way that digital tools and environments are particularly interesting as they offer new languages for designing, new tools for exploration, they enable the designer to access and engage data in fundamentally different and direct means. Studio as a means of design education takes on a different role when digital tools are available. The student's experience in developing creativity is then enriched beyond that of the traditional studio by these digital opportunities. The digital environment is not simply replicating or extending the analogue experience but rewrites it.

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