

# Design education as a passport to professional practice, EPDE 2010 - when design education and design research meet

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# DESIGN EDUCATION AS A PASSPORT TO PROFESSIONAL PRACTICE

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## ABSTRACT

The idea of a community of professional practice is a powerful one. There are communities of design practitioners for such groups as architects, graphic designers and others (this is illustrated through the example of automotive design). In design education which focuses on developing capability in design practice, the implicit ambition is to provide students with those abilities which enable them to join the community of practice. Those abilities include both being able to engage in design thinking, and being able to externalize that capability through drawings and other process and solution representations. At the core of being able to engage in designerly thinking, balancing creative and evaluative thinking is a dual processing match of linear and simultaneous processes as a conversation between these two modes of thought. For design students achieving this match involves confronting and traveling through a key threshold which we have labelled the 'toleration of design uncertainty'. For students of design, their drawings and other visual material provide evidence their capability and when gathered together become their passports to enter the community of practice. The re-design of the Coventry design programme to accommodate these findings is briefly described.

*Keywords: Practice Communities, Designerly Thinking, Threshold Capability, Passport.*

## 1 THE DESIGN PASSPORT

The Centre of Excellence for Product and Automotive Design (CEPAD) is one of Coventry University's three HEFCE-funded centres for teaching and learning. It has implemented a five-year plan to reinforce existing teaching excellence within the Industrial Design Department of Coventry School of Art and Design and reflect upon its practices to inform future design education. The project pursued a number of themes including those in this paper. There is a long tradition of teaching design through design practice. Students who wish to become proficient as designers spend a significant proportion of their time tackling design problems. The student experience is of progressively more complex design exercises, often culminating in projects which mimic real world designing. The end goal is often seen as that of achieving a level of capability sufficient for students to match that of professional design practitioners. Their education serves to provide them with a passport to enter this community. The physical manifestation of their passport to design practice will typically be the portfolio of design work, in which they demonstrate that they can tackle design problems to a standard which is recognizable as appropriate in a professional arena.

## 2 COMMUNITIES OF PRACTICE

A community of practice is typically a group of professionally qualified people in the same discipline all of whom negotiate with and participate in a mutually understood discourse which is both explicit and tacit. [1] This may be understood in terms of Lave and Wenger's Community of Practice Theory [2], [3]. This was proposed as a social theory of learning which contextualises the process as part of our 'lived experience of participation in the world' [4]. The proposition is that learning takes place through a deepening participation in such a community of practice. Wenger identifies the principles of a community of practice as covering groups of people who share a concern or a passion for something they do, and interact regularly to learn how to do it better. Members of a community of practice are

practitioners who develop a shared repertoire of resources, engage in joint activities and discussions, help each other, and share information. Learning within a community of practice is an experience of identity formation. It is not just an accumulation of skills and information, but also a process of becoming – in this case a certain kind of creative and critically minded design practitioner [5]. It is through this “transformative practice” [4], that within a professional community of creative design practitioners, learning can become a source of motivation, meaningfulness and personal and social energy. The emphasis on practice is the source of coherence in the community, including all the implicit relations, tacit conventions, subtle clues, rules of thumb, recognizable intuitions, specific perceptions, well tuned sensitivities, embodied understandings, underlying assumptions and shared views [6].

### 3 DESIGN COMMUNITIES/ AUTOMOTIVE DESIGN

Designers come in many types- architects, industrial designers, design engineers, graphic designers, fashion designers, jewellery designers etc. Each represents a significant group of practitioners and could be regarded as a community of practice. For key groups there are formal national bodies to which entry is by examination. The less formal groupings can be international in scope. A powerful example is that of the community of practice of automotive designers.

Harley Earl, Head of Design at General Motors was key to its development [7]. He created the striking appearance of the company's vehicles from the thirties until the end of the nineteen fifties. A lasting legacy of Earl's approach is the structure of the automotive design process. He managed 5 separate car design studios, and 12 specialist studios with many designers, clay modellers, engineers and managers sourced internally and externally. Some took up jobs with other car companies, throughout the world and they came to function as a community of practice having a shared experience of studios, vocabulary, enthusiasms, and similar attitudes. General Motors is no longer the world's biggest company and the community is now international and multi-company. With car design studios in all of the major industrial countries of the world, designers in them constitute a community of professional practice which is visible and high profile, which many students of transport design aspire to join.

If the notion of design education as providing a passport to the professional community is to be acted on then it is essential that design professionals be engaged in it. This has been taken seriously at Coventry University for its transport and product design scheme. A high proportion of the staff has come directly from professional practice. In a 4 year scheme, there is industry related project work from year 2 onwards, professional placements and internships and often involves work outside the UK. CEPAD engages in client-funded design and research (eg Benero and Microcab). These mechanisms ensure the professional relevance and industry orientation of the programme and the work is presented to a high level of professional polish. Typically students leave with portfolios of work whose presentation matches the work of the industry design studios. That aspect of the portfolio's function in providing a passport to practice is being achieved. Feedback from industry colleagues is that the element most needed in such portfolios, the excitement or ‘wow’ factor, is also the most difficult to achieve. Competence in presentation is not sufficient on its own, there needs to be a complementary engagement with developing creative design thinking capability.

### 4 DESIGN THINKING AND CAPABILITY

Design practice for any specific design area calls on a range of technical capabilities, shared enthusiasms, understandings, and domain specific skills. These are extremely important in the identity of the community of practice. However one of the distinguishing characteristics of designers is that they function differently from other specialists. What designers do is design; they create designs and solve design problems. The contention in this paper is that in order to function effectively as designers they must engage in the designerly way of knowing. For each type of designer there is a range of domain specific knowledge and expertise which is crucial to their functioning. Fashion designers must know all about both fabric and clothing manufacture, and must be able to key into the latest trends in catwalk style. Architects need expertise in planning controls, building technology and regulation, and architectural practice. Each type of designer has equivalent areas of specific expertise and knowledge to distinguish them. What they share is their ability employ designerly thinking. Our assumption is that designing ability can be described in terms of both generic and specialist capabilities. The generic

are those which are shared by designers across a wide range of specialisms. The specialist capabilities are those which distinguish designers in particular areas. Cross has called this generic design capability the Designerly Way of Knowing [8]. In the practice based approach to design education we suggest that the intention is of combining the generic designerly thinking with the domain related specialised knowledge, to produce a level of overall capability sufficient to gain entry to the relevant community of practice. Teaching design through such 'transformative practice' is centred on tackling design problems which become progressively complex. Reinforced by industry involvement, with this professional engagement comes a picture of designing ability described as both generic and specialised.

Cross characterises design as an activity involving tackling 'ill-defined' problems and that designers are solution not problem focused (8). The designer's attention oscillates between the problem and solution, in an appositional search for a matching problem-solution pair, rather than a propositional argument from problem to solution. Designers tackle problems which are ill-defined, ill-structured, or 'wicked' and lacking information. The quick production of a draft solution helps define the limits of the problem and in idea generation. The solution conjecture could be said to facilitate the re-examination of the problem by providing the spectacles through which to look at it. The designer is able to tell where she or he needs more data because without it the design cannot move forward. This solution-focused strategy may be formalised as a requirement for a 'Concept Design' which is the attempt to provide an early representation of the finished design. If the design manager sees the concept as providing a basis for proceeding then the process falls into place. This solution-led approach has, at its core, the movement from an abstract statement to a visual object with the match of the analytical statement to the holistic solution as a drawing, a 3D or virtual model.

## 5 THE ANALYSIS- SYNTHESIS MODEL

This picture of the design thinking processes corresponds with the classic analysis-synthesis description of the process. Such a dualistic characterisation corresponds with the view of brain function which orders cognitive activity to align it with the different characteristics of the two halves of the brain, or cerebral laterality. There is strong evidence that underlying the left hemisphere's dominance in expressive speech and the right's in manipulospatial activities are different processing modes characterized as analytic-synthetic, linear-holistic, serial-parallel or focal-diffuse for the left and right halves respectively. It is clear that for anything other than very simple mental operations, both halves are involved, as has been shown in EEG maps of cerebral activity. It seems the two processing modes are employed at the same time, interactively, and a more complete understanding of a problem arises from matching initially separate simultaneous mental operations. Design thinking may be organized in a similar way, with two simultaneous interacting cognitive styles employed. An analytic, linear strategy is at work in the process of data organisation to yield a design specification and in evaluating design proposals, and a synthetic-holistic strategy in the generation of solution conjectures, the integration of visual relationships and the physical representation of the design. These two interacting lateralized mental operations can be used to map out design thinking and help understand it. Tovey has called this the dual processing model of the design process [9]. In order to offer a way of characterizing some of the key areas identified in our investigations into design pedagogic process Figure 1 maps the industrial design programme activities onto the dual processing model.

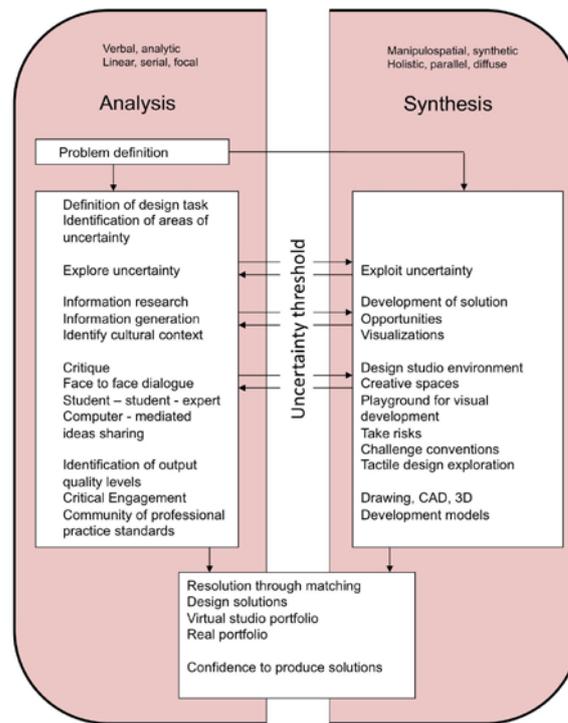


Figure 1. Analysis – Synthesis Model

## 6 IDENTIFYING THRESHOLD CONCEPTS IN DESIGN

The ‘dual processing’ strategy employed by designers involves a ‘conversation’ taking place between these two modes. The result of this ‘conversation’, in what Tovey describes as an ‘incubation period’, enables a designer to arrive at a ‘solution’. However, qualitative data from a longitudinal study carried out by CEPAD into identifying threshold concepts in design with a cohort of industrial design students from entry (2005) to graduation (2009) showed that some students, presented with typical ‘wicked’ design problems [11] may get stuck in this ‘conversation’. Often students are trying to satisfy what they think tutors want rather than deploying their creative abilities and those who do not get beyond this can remain in what Meyer and Land describe as a ‘liminal state’. In this context a liminal state relates to the notion of a threshold concept, akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding, or viewing something without which the learner cannot progress. [12] Students can be stranded within a liminal space while they struggle for understanding and which can involve identity shifts and ‘troublesome, unsafe journeys’ [13]. As reported in Osmond et al, [14], a threshold concept also features other characteristics: it is a *transformative* involving a personal and conceptual change; *irreversible* in that it will not be easily forgotten; *integrative* in that it allows hitherto unrelated knowledge to ‘slot into place’, and *troublesome* in that it appears ‘counter-intuitive, alien...or seemingly incoherent’ [12]. For students who are ‘stuck’, in order to move beyond a liminal state they need to experience a transformation to navigate this uncertainty, and to develop the confidence to challenge design conventions, produce solutions and innovative designs. From the study it became clear that once students accept that each time they approach a design brief they will experience this uncertainty then they are able to use the tools and methods inculcated within their programme to harness their thoughts and ideas and begin designing. In essence, the research identified a threshold concept, which CEPAD has labelled as ‘the toleration of design uncertainty’, defined as ‘the moment when a student recognises that the uncertainty present when approaching a design brief is an *essential*, but at the same time *routine*, part of the design process’. From this analysis the notion of providing a safe ‘creative space’ in which the students could experiment emerged. As this was a key change, the design programme should be revised to incorporate both scheduled time and physical space to allow it to happen.

## 7 CEPAD AND CURRICULUM INNOVATION

The distinctive nature of design education is highlighted by Cooper and Press [15] based on a 'traditional learning by doing' approach. Student projects integrate knowledge and skills through practice, engaging in a dual-processing approach. Industrial design education encourages students to gain an experienced-based knowledge which involves experimentation and risk of failure. Industrial design education has always supported such novel and participative forms of teaching. However this can be difficult to embed in a strict modular structure devised for linear and highly structured models of teaching. In CEPAD we have explored a number of activities that have helped us to move from the 'standard' and established practices of teaching to a set of activities built on the 'Dual-Processing Model'. The intention has been to explore teaching interventions that would with the design uncertainty threshold sitting at the centre of the two modes of thinking, analytical and synthetic, and across both linear and holistic design approaches. The aim is to encourage a 'conversation' or engagement with design problems and opportunities by drawing a student through a set of activities, modes of thinking and design approaches that support a more exploratory approach with larger holistic packages of learning to create a 'playground' for unconstrained design thinking. The environments integrate traditional and advanced technologies and provide the opportunity for professional and international engagement. These recommendations have been applied in October 2009 to the first two levels of the four year programme in Coventry. Early feedback collected via interview and focus group is positive [16], [17]. The programme has maintained good relationships with industry and internships, international exchanges, and cross-cultural collaborative projects have been reinforced.

## 8 CONCLUSIONS

Central to the notion of a Passport to Design Practice is the recognition of the existence of communities of design practitioners. There are large international communities of design practice whose influence can be profound. Gaining entry to such a group will involve demonstrating familiarity with its domain specific skills and capabilities and being on top of specialist information. But each of them also requires capabilities which are generic across design specialisms. For those embarking on practice based design education where they will spend much time tackling design problems, these shared capabilities are part of the core competency which they need to master. The designerly way of knowing involves a solution focused creativity in which there is a match of holistic and evaluative processes. In the conversation between these two modes the design uncertainty threshold is engaged as an essential but routine process. Whereas industry engagement is productive in inculcating professional level presentation skills, the achievement of effective designerly thinking could be facilitated by a re-organization of the design teaching programme. Following a longitudinal study such an arrangement based on the analysis- synthesis grouping and devised to both encourage creative processes, and accommodate the uncertainty threshold, is being trialed. The early signs for its success from both students and industry are encouraging.

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