

# Research in Design Pedagogy

Professor Michael Tovey, Reader in Design Pedagogy and Professor of Industrial Design, Coventry University

This special issue of the journal is based on a selection of papers from the Design Research Society's 2012 conference which was held at Chulalongkorn University in Bangkok. The conference theme was 'Reforming traditions, reshaping boundaries', and the papers presented reflected that aim. As is always the case with the DRS conference the selection of papers was by double-blind peer review process, with the intention of maintaining high academic standards. The conference was organised so that papers were grouped into related streams, with the majority organised to match the Special Interest Groups of the society. One of these is the Design Pedagogy group, and its stream was particularly strong with 24 papers. It is from that stream that papers for this special issue were selected.

The Design Research Society has three main aims. It focuses on recognising design as a creative act, common to many disciplines. It has the intention of understanding research and its relationship with education and practice. Then there is the overall aim of advancing the theory and practice of design. The membership of DRS is international.

The Society's Special Interest Group in Design Pedagogy is one of five in the society. It aims to bring together design researchers, teachers and practitioners, and others responsible for the delivery of design education, and to clarify and develop the role of design research in providing the theoretical underpinning for design education. These aims are not directed simply at one type of design education, but are intended to include all ages. However as the current membership of DRS is predominantly from universities inevitably the conference stream has concentrated on design education at that level.

One of the purposes of design education within schools is to equip students with the information and capabilities they need if they are to apply to study design at a university. It is an intention which probably applies to a minority of the students, but it is important nonetheless. In schools design education overall has to achieve much more and its broader reach is extremely important. A key question is to what extent research into design pedagogy has this wider relevance.

In the recently published 'Design and Designing: a Critical Introduction' (editors S. Garner and C. Evans) it was proclaimed that the intention of the book is to provide an

overview of design which is suitable for those students who are considering embarking on a university or college education in design (1). It is a collection of essays with a large number of contributors each illuminating a different aspect of design. For example, in the first chapter Tovey asserts that the purpose of design education at this level is to provide students with a passport to enter the community of practice of professional design. This has been the intention of practice based design education for a significant time. For most students their end goal is to achieve a level of capability to function as designers in the professional world. In order to reach this standard students need to achieve a level of professional 'polish' and presentation to match that of the practising designer. However Tovey also argues that the key to their doing this lies in their abilities to think in a solution focused way employing visuo-spatial intellectual abilities. Most particularly if they cannot think creatively they will not achieve the required standard. The ability to engage in creative thinking, and more particularly the creative synthesising of ideas through design thinking, is the most important capability required to enter the community of professional practice.

Abilities such as these, to tackle problems with a solution focus, to think visuo-spatially are not developed ab initio at university and college level. These are abilities which must be inculcated from an early age. Some see spatial ability as being a fundamental form of intelligence along with others such as numerical and literary abilities. Cross has gone further in suggesting that designerly thinking might be a basic form of intelligence (2). Although the case for such a view is not proven, it is a productive stance to take as it helps to identify and clarify features of the nature of design ability and it offers a framework for understanding and developing it. What seems to be generally agreed is that these underlying capabilities are ones which need to be nurtured early and developed, not only as the basis for studying design but also to equip students with abilities needed across a range of occupations.

Researchers investigating issues in design pedagogy at university level inevitably look into aspects of these fundamental concerns. Many of the papers in this special issue touch on drawing as a key ingredient in designing. The ability to draw is an important skill for developing visual thinking ability. Its use in design is particular, and

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distinct from its use in other areas. Designers must represent something which is an idea and externalise it. This is different from drawing that which is in front of you (as in a life drawing exercise). For a designer the drawing gives concrete expression to a design idea, and in so doing it can have a basic function to support synthesis and concept designing.

Drawing is often seen as not only a method for facilitating visual thinking within designing but also as the technique which provides the evidence that such thinking is taking place. Thus a drawing is regarded as the externalisation of visual design thinking, and the use of design diaries can be seen as a process for keeping a record of that visual thinking. In their paper Babapour, Rehammar and Rahe examine the use of such techniques to externalise design thinking about such core visual processes as form generation and addressing the aesthetic aspects of the design proposal. They examine a range of variously structured and unstructured diary methods and use comparative evaluation methods such as qualitative analysis to identify strengths and weaknesses.

Further approaches to facilitating visual thinking through drawing are described by Croft. It is assumed in this paper that drawing can be a method for visualising thinking, and that from the drawings produced by students gaps in their process can be identified. Drawing is seen as the best technique for reducing a perceived gap between thinking and doing. This is addressed through a series of interventions at stages in design practice activities, and a responsive approach is applied to signal the direction for future work.

In much of the work on the uses of design drawing and sketching the visual technique is augmented by verbal communication. In their paper Nik Ahmad Ariff, Badke-Schaub and Eris investigate the relationship between sketching and communication in words during the ideation process in early concept generation. A number of test groups tackled a design problem in a specified time, and the experiment was given focus through the application of different communication constraints. They conclude that within design teams sketching cannot stand alone but requires communication in words if the design process is to work.

Further research into the processes of collaborative design has been undertaken by Erbil and Dogan. They demonstrate the use of various visualisation techniques in collaborative architectural teams with reference to their convergent and divergent idea generation processes. They look into how creativity can be fostered in collaborative work contrasting

the methods of the individual originality with the needs in a team to sign up to a common design idea. An analysis of groups of students working as teams entering architectural design competitions was undertaken, to identify the barriers and team roles in engaging with convergent and divergent concept generation.

Of course the time is long past when design drawing could be regarded as something undertaken simply using pen and paper, even if those of us who are long in the tooth still regard that as a very good approach. Now digital media are employed and much design research has been into the efficacy of such techniques. Two of our papers touch on this area.

In their paper Jun-Chieh Wua, Cheng-Chi Chenb, and Hsin-Chia Chen analyse the thinking processes of design students employing digital media and traditional paper in the early concept stage of the design process. They engaged in a protocol analysis of the designers' thinking behaviour using different media during structured problem solving. They reach a number of interesting conclusions, from the anticipated such as the value of proficiency and background knowledge, to the observation that digital media had a beneficial impact on the processes of detail design. The use of new media could be seen to support a more complete design activity.

A quite different area of media support for design is investigated by Ru Zarin, Lindbergh and Fallman. They report on a long term study on the use of stop motion animation in architectural design. It has the ability to illustrate the dynamic circumstances which a building will experience through the seasons, different light conditions, various patterns of use and so forth. They use evidence from a workshop to bring stop motion animation into the area of sketching to argue for the potential extension of its use.

What these papers illustrate is the wide range of uses of design drawing to support different aspects of the design process and different types of design. It is clear that they contribute to an activity which is about visual thinking, and thus is part of visuo-spatial intelligence. And where the design activity is concerned as it almost always is with the design of a visual object, be it a in 2 dimensions as graphic design, or in 3 dimensions as a product, technology or a building, then it is self evident that it must involve visual thinking. That the use of visualisation is common to many design disciplines is just one reason why we believe that there is a shared process of designing. The design activity can be seen as generic. Furthermore this process and the designerly way of

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knowing could have the potential for application across a wide range of activities, particularly in the teaching context.

Elements of this are illustrated by Scheer, Noweski and Meinel in their paper. They look at the constructivist learning initiative, which intends to inculcate an approach which is 'constructed, self-regulated, situated, and collaborative'. They identify a missing link between the pedagogic theory employed and its practical implementation, asserting that this leads to a negative classroom experience. They claim that a methodology based on design thinking for project orientated learning offers the support which is needed. Through a case study they demonstrate the improvements to the classroom experience which can flow from employing design thinking, and the consequent empowerment of the teachers.

A further demonstration of the generic approach to design pedagogy is provided by Shreeve and Batchelor in their paper. They note that at the heart of studio based teaching and learning for design subjects there is the engagement by students and tutors in practice which simulates the work of professional designers. This is part of preparing the students for entry to the world of professional practice. They report on a small sampling process as part of a research project to explore the student/tutor relationship in design pedagogies across a range of academic levels and subjects. The data produced provides a rich account of relationships which are mutable, ambiguous and uncertain in character within the structured relationships deployed. Despite several complicating contextual factors the most positive learning engagements are working towards a two-way exchange on an equal level, and this is what produces students who are independent practitioners in their own right.

This special addition has grown from the DRS conference in Bangkok. We also include a review of the conference by Fiona MacIver. She captures extremely well the positive character of the event and the high energy level present at it. Some of the richness of the conference is reflected in this collection of papers.

We conclude with reviews of two significant publications. Lance Green reviews 'Product Design: A course in first principles' and Aidan Rowe reviews 'The Global Studio: Linking research, teaching and learning'.

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## References

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**Michael Tovey**  
adx907@coventry.ac.uk