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Selection of Papers from DRS 2016 Conference for a Special Issue of the Journal

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This issue of the journal is distinctive as it is the first published through the online Open Journal System. The system is intended to be both more efficient and to improve the access and visibility of its content. It is also distinctive as it is one of our regular series of special editions.

This particular special edition of the journal is devoted to a selection of papers which have been chosen from the recent DRS 2016 Conference. They have been chosen from the Design Pedagogy Special Interest Group strand.

The conference has been generally regarded as having been highly successful. It was celebrating the 50th anniversary of the creation of the Design Research Society, and included much reflection on the nature and relevance of research in design. In general it was very positive in tone and affirmed the strength and relevance of the discipline. The conference was hosted by the University of Brighton and the sea side city proved to be a cheerful and engaging location replete with cultural delights. The physical climate might have been a bit wet and windswept, but the intellectual climate was stimulating and innovative, with much live debate.

The underlying affirmation was that 50 years of design research has provided us with a sound understanding of design and a solid foundation upon which to build. The papers in the conference addressed three broad questions:

How can design research help frame and address the societal problems that face us?

How can design research be a creative and active force for rethinking ideas about Design?

How can design research shape our lives in more responsible, meaningful, and open ways?

The DRS has 9 established Special Interest Groups (SIGs) which the organizing

committee thought important to prioritize. Each of them had its own strand as a kind of mini-conference within the overall arrangement. The Design Pedagogy strand was the largest of these, having the most papers and sessions.

The aim of the Special Interest Group in Design Pedagogy is 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 there is some emphasis on design education at that level.

It was clear that within the design pedagogy strand the main questions of the conference were being addressed in the context of design education. In other words it is possible to see an approach

to design education research which is relevant to societal problems, which offers creative insight to ideas of design, and helps us to shape our lives. Indeed design education provides an arena which is rich in potential for such a range of ambitions, especially if we consider the full age range at which design is studied.

Amongst the key figures in research in design education who attended the conference was Professor Liv Merete Nielson of the Oslo and Akershus University College of Applied Sciences. She provides the conversation piece for this special issue. She argues for the relevance of design education from kindergarten to PhD, stressing the importance of design pedagogy research at both ends of the age range and points in between.

The papers we have chosen from the conference have been selected for their quality and relevance to the journal. Incidentally they also demonstrate the age range of design education research, and its international spread. With papers from Australia, Sweden, Turkey, the UK and the USA, design education researchers can claim to be a global community.

In their paper 'Digital Sketch Modelling: Integrating digital sketching as a transition between sketching and CAD in Industrial Design Education' Charlie Ranscombe and Katherine Bissett-Johnson report on an innovative approach to teaching design practice involving digital sketch modelling. The intention is to combine the strengths of sketching in ideation and CAD in dimensional accuracy while developing the digital sketching skills that are now expected of graduates going into industry. In doing so they move beyond treating digital sketching as an equivalent of traditional sketching to its becoming a new transitional design tool. They set out the key steps of the digital sketch modelling technique and report on its integration in the industrial design curriculum.

In 'Visual Thinking Styles and Idea Generation Strategies Employed in Visual Brainstorming Sessions Naz A.G.Z. Börekçi describes a study of the thematic content of the ideas generated by groups of students, and the individual representation styles used for their sketches. The analyses reveal the determinants of individual visual thinking styles such as idea types, sketching patterns, sketching styles, annotation styles, and effectiveness in producing design solutions. He identifies the idea generation strategies employed and the effects of group dynamics to provide four profiles of idea generators.

In their paper 'The Future of Product Design Utilising Printed Electronics' Nicola York, Darren Southee and Mark Evans describe the introduction of printed electronics to industrial and product design students as both a disruptive technology, and an approach to knowledge transfer. Through an overview of the technology and a comparison with conventional electronics good product examples can be identified. Two case studies illustrate approaches to knowledge transfer. From a review of the assessment criteria and design outcomes from the case study projects, new approaches can be proposed. They conclude that there is a need to develop a thorough knowledge transfer strategy for printed electronics to designers, informed by case studies and extending beyond simply showing examples of existing technology. This is necessary for future proofing both in technological advances and design.

In 'Visionary Expectations and Novice Designers – Prototyping in Design Education' Jennie Andersson Schaeffer and Marianne Palmgren identify a key challenge in information design education of formulating and using methods that support design students in developing

competencies in the space between basic form training and context-rich training. The aim of their study was to evaluate prototyping exercises in this area. They looked at four different approaches, spatial prototyping: multi-material prototyping, physical prototyping and a mix between the latter two of physical multi-material prototyping. They conclude that although the prototyping exercises did support the learning of diverse competencies in the in-between space, they were also counterproductive and met with different kinds of resistance. What is needed is a dialogue on how different prototyping techniques can stimulate learning in relation to future design competences.

In their paper 'Using Design Thinking to create a new education paradigm for elementary level children for higher student engagement and success' Lesley-Ann Noel and Tsai Lu Liu review and synthesize existing literature to make a preliminary analysis, which will support the development of design thinking education interventions at primary school level. It has been demonstrated that design can play a successful role in supporting traditional education models in the delivery of skills in mathematics and languages. They seek to demonstrate that in addition to meeting these demands, design thinking principles such as empathy, collaboration and facilitation, human-centeredness, and creativity by iterations of prototyping and testing, can provide a sound base for children not only seeking to enter design but moving into any profession in the future This will lead to higher engagement at school and greater overall success in life. They argue that this could provide a paradigm shift in education at this level.

In 'A case study in online formal/informal learning: was it collaborative or cooperative learning?', Iestyn Jowers, Mark Gaved, Gary Elliott-Cirigottis, Delphine Dallison, Alan Rochead and Mark Craig report on a study of the development of communication and collaboration skills of undergraduate design students working remotely and vocational learners based in a community makerspace. Participants engaged in a design-make project framed in the context of distributed manufacturing. They were given designer or maker roles and worked at distance from each other, communicating using asynchronous online tools. They employed a diversity of working practices, which highlighted the difficulties that result from getting students to work collaboratively, when not collocated. From the analysis of participants' communications it was found that engaging participants in joint problem solving is not enough to facilitate collaboration. Effective collaboration depends on symmetry within the roles of participants and willingness to share expertise through dialogue.