Guest Editorial: Building a Collaborative Design Education Community

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I am very grateful to Erik Bohemia for approaching me in August 2017 with the suggestion of guest editing a section of this issue. Erik and I form part of the organising committee for the International Conference on Engineering & Product Design Education (E&PDE) and I have selected six papers from the 19th E&PDE Conference, held in September 2017 at the Oslo and Akershus University College of Applied Science. 160 delegates from over 25 countries presented 117 papers, including 16 from students, on the theme of *Building Community: Design Education for a Sustainable Future* and the papers that I have chosen to represent a broad cross-section of those, covering a range of topics of interest to those engaged in design education, and they all provoked much debate and discussion. The papers presented here have been expanded and updated to take into account feedback received from other delegates at the E&PDE conference.

The E&PDE annual conference series started in 2000 and is organised jointly by the Design Education Special Interest Group (DESIG) of the Design Society and the Institution of Engineering Designers. E&PDE 2018 will be held in the new Dyson School of Design Engineering at Imperial College, London, and is being jointly organised with the Royal College of Art, London with the theme of *Design Education: Diversity or Conformity?* The conference series stays in the UK next year with E&PDE 2019 *Towards a New Innovation Landscape* being hosted by the Department of Design, Manufacture and Engineering Management, University of Strathclyde, Glasgow.

The theme of building communities and sustainable futures inspired many of the authors, and the first three papers that I have chosen reflect this desire for new design thinking and new ways of working to build better solutions for all users. It is clear that many of the authors were inspired by the theme of *Design Education: Collaboration and Cross-disciplinarity* from the E&PDE 2016 Conference in Aalborg University, Denmark, with many examples of papers from mixed discipline teams or from academics working alongside colleagues from industry or NGOs. The final three papers that I have chosen discuss how colleagues have worked with others from different teams within their universities or from external organisations to bring valuable new insights into their education environments.

Anne Britt Torkildsby (The Norwegian Research Laboratory for Universal Design, NTUT Norwegian University of Science and Technology) discusses her development of a critical design method in *Critical Design in Universal Design Settings – Pedagogy Turned Upside Down*. This method has been conceived as a way for students to explore immersion in extreme environments such as hospitals

and prisons, and to consider the wellbeing of users in these situations. By adapting this method to universal design problems, she hopes to develop future designers that approach designing for all users in new and novel ways. Turning traditional universal design processes upside down, her method asks what it means to design for fundamental human needs. Her design method is a 3-step approach developed through 8 workshops in Scandinavian Design Schools with students from a range of design backgrounds. Students found this new way of design thinking liberating, and it changed their view of problem solving by turning traditional pedagogy upside down. The method contributes to universal design as a teaching and learning method, and it helps students to think, analyse and evaluate in a critical manner.

In *Developing Empathy for Older Users in Undergraduate Design Students* Andree Woodcock (Coventry University), Deanna McDonagh (University of Illinois) and Jane Osmond (Coventry University) argue that empathy is a key skill for designers and describe their efforts to ensure that her student appreciate and understand users with different abilities, and how they engage with transport. By striving to incorporate and provide opportunities for empathic design projects in the curriculum she uses low fidelity, experimental prototypes to expand students' empathic horizon. They give ways of understanding 'the other' through 'quick and dirty' techniques scaffolded with a reflective cycle to extract knowledge and learning from the experiences. Her 'framework of ideation' has been implemented through a cohort of final year design students where they are given impairments to their vision, hearing, mobility and touch. The students experience full immersion through experience prototyping which left students feeling vulnerable and heightened self-conciousness, thus increasing their ability to empathise with others, and hopefully go on to design products that are more suitable for their needs.

Linda Shore, Louise Kiernan, Adam DeEyto and Deirbhile Bhaird (University of Limerick), Anne Connolly (Ireland Smart Ageing Exchange), P J White (Institute of Technology Carlow), *Older Adult Insights for Age Friendly Environments, Products and Service Systems,* Tracy Fahey (Limerick School of Art & Design), Siobhan Moane (Limerick Institute of Technology) form a collaborative coalition of academic institutions in Ireland that have organised co-design symposia to show how design can affect change and influence policy. This paper highlights the importance of needs requirements for age friendly environments and involving students in participatory design research, and they use Ezio Manzini's definition of co-design as a "social conversation" from his 2015 book Design, When Everybody Designs – An Introduction to Design for Social Innovation (MIT Press). The authors stress the role of co-design and co-creation, both expert and nonexpert, in the ongoing wave of social innovation toward sustainability and inclusive design.

Gary Underwood (Bournemouth University,) and John Powell (Royal National Lifeboat Institute (RNLI)) describe their experiences of resolving design problems in low-resource communities as sustainably and ethically as possible through responsible use of local resources in *Rescued by Design: Enabling Low Resource Communities to Reduce Global Drowning*. They concentrate on the RNLI initiative to reduce global drowning statistics, and use this project in Bangladesh, where 50 children drown every day, as a vehicle to understand if students can gain sufficient understanding

of relevant issues to design for unfamiliar cultures. They also ask why communities are looking for designers from the other side of the world to provide low tech solutions for local problems. By highlighting the problems and benefits of low resource design projects, they discuss problems of validation, compliance, moral and social issues. Through a series of co-design and co-creation projects they are producing a community of practice – *Rescued by Design* – a resource hub related to lifesaving equipment. They end with a call to a global society of local innovators and designers based on innate local traditions of cooperation and community action to co-create solutions to design problems in low resource societies.

Decision Making in Product Design – Bridging the Gap Between Inception and Reality Julian Lindley (University of Hertfordshire), Richard Adams (University of Hertfordshire) and Les Wynn (HCL Technologies) discusses the development of a structured and validated approach to decision making within the design process. A pilot study was conducted whereby a commercial decision-making tool from HCL Technologies was introduced to final year students to validate the selection of appropriate designs from a range of concepts against a hierarchy of criteria. Design decisions increasingly need to be justified and validated, and the authors discuss a grey area of uncertainty, a design decision gap within current design processes such as the Design Council's Double Diamond model. Tools and techniques such as an HCL's Idea Filtering Analysis, discussed in the paper, could prove useful in helping students to understand what constitutes a rigorous design process, and help to highlight areas where further time needs to be spent to develop their understanding.

In *Mobile Eye Tracking in Engineering Design Education* Stephan Hess, Quentin Lohmeyer, Mirko Meboldt (ETH Zurich) consider how students perform functional analysis of complex machines and systems. By asking what prior knowledge students need and how they can be helped to understand the functions of the system, the team from ETH Zurich have developed a mobile eye tracking system. This has been used to compare high and low performing behaviour for undergraduate mechanical engineering students, obtaining insights into user's cognitive processes. They found that a basic engineering design education was a prerequisite, as this imparts a suitable mindset from which to improve their ability in functional analysis. The work also confirmed that a wide technical knowledge base is required in order to understand complex systems, including the relevance and function of each part or subsystem in the whole. It also had a great bearing on the time taken to understand some of the more complex or unusual parts, making this work particularly relevant in time sensitive applications or in technical examinations.

Finally I would like to thank Prof Kay Stables for her help and support in the preparation of these papers as well as all of the authors for working with me in such a timely manner to get these papers prepared for publication. I hope that you enjoy reading the papers and draw some inspiration from reading them.