Editorial

Continuing a methodological approaches thread

Kay Stables, Goldsmiths, University of London, UK

Lyndon Buck, Buckinghamshire New University, UK

Donal Canty and Niall Seery, the guest editors in this issue of the journal, have taken particular decisions in choosing the articles that, amongst other things, demonstrated the breadth of and relationships between research agendas that have developed over the many years that the PATT conferences have brought together an international community of researchers in design and technology education. Their choices have included fore-fronting early career researchers and research agendas emerging from the 2018 PATT conference. But their choices have also illustrated a breadth in research methodologies that have been presented through the articles included. This illustration of breadth continues through the articles in this issue that have been submitted through the regular system. Guest editors curate their selections. By definition general submission create a more haphazard collection. We have four such submissions in this issue, two reporting on higher education, two on schools education, one from Finland, one from Ireland and England, one from Turkey and one from the USA. All four are individual and fascinating accounts of research. By chance, they provide four distinctly different methodological approaches and, in preparing this editorial, this difference appeared as a collective contribution, illustrating a richness of methodologies to be considered, modified and exploited by others.

Seeing links and exploiting them is paving the way for future guest editions – some prompted by the editors, some emerging from the community. We are delighted to include the guested contribution in this issue and would be very happy to receive proposals for future guest contributors. Please get in touch if this interests you.

But now to the remaining articles.

In *Using a Hybrid Pedagogical Method in Undergraduate Interior Design Education*, Suchismita Bhattacharjee (University of Oklahoma, Norman, USA), presents research exploring a flipped classroom pedagogical approach. The research was undertaken with second year undergraduate students in an interior construction class in three consecutive years, each year taking a different approach (traditional, flipped, then a hybrid of the two). The motivation behind the research was to explore ways of providing opportunities for greater amounts of time for students to apply knowledge through hands on creative activity. The focus and content of the course was similar across all three years researched – just the pedagogy changed. Data was collected via a pre and post test was completed by the students and student assessment grades were also utilised. In addition, student evaluations were collected. The article provides understanding of the detail of the three pedagogic approaches taken and fascinating insights into the variation across the three years of students. The overarching conclusion was that the hybrid approach was the most

successful. A useful account is also provided of what students found to be the most critical success factors and how the approach could provide a way of transitioning more successfully to a flipped approach.

In *Evaluating Adopt-ability of Open Source Tools for Problem Solving in Specific Design Tasks in Industrial Design Education,* Onder Erkarslan and Zeynep Aykul (Izmir Institute of Technology, Turkey), report on research that explored the ways and extent to which undergraduate industrial design students made use of Open Source Tools (OST) in their design learning. They begin by providing insight into a broad range of OST that have potential to eliminate design 'obstacles' in Industrial Design Education but indicate that their effectiveness in this context needs greater exploration. They posed research questions such as how and why they should be used, what stages of designing they could support. How and why students should engage with open source communities and how students responded to using OST when designing. In a study involving students from three different Turkish universities, they made use of both quantitative and qualitative approaches, first gathering survey data to investigate whether OST can help students and the level of awareness and knowledge students held. This was followed by two case studies of students using such tools when designing. The first project involved students re-designing studio projects using OST. The second involved group projects where their designing was undertaken in a way that simulated an open source community. The article provides a useful and broad range of examples from student projects. Amongst a fascinating set of findings, a stand-out insight was student's initial inability to see a need for open source – they couldn't see the value of collaborating, as their experience of education was about their own attainment. Once working in the collaborative, simulated community their perspective changed from that of an individual student to focusing more on preparing to take a place in their profession.

In *The roles of material prototyping in collaborative design process at an elementary schoo*l, attention is turned to young children's education. Varpu Yrjönsuuri, Kaiju Kangas, Kai Hakkarainen and Pirita Seitamaa-Hakkarainen, (University of Helsinki, Finland), report on research into maker-centred design learning with 10-11 year olds working collaboratively to prototype ideas in open ended design projects. The authors were interested in prototypes as aids for thinking, as social mediators in collaborative designing and as material constraints and inspiration. The research was undertaken with 75 children working in small teams, across 11 weekly sessions of 90 minutes. The children were supported by one craft teacher and three class teachers, researchers and other experts, such as parents and a professional inventor. The aim was to co-invent and prototype novel ideas for everyday problems. Data was collected by video, analysed at macro, intermediate and micro levels. The macro level analysed the flow of design activities coding verbal actions, embodied actions, non-task related actions and collaboration, mapped as 'process rugs' that illustrated beautifully the interweaving of types of design activities. Intermediate analysis focused on significant events and micro analysis was highly detailed coding of 16 significant events. The many findings illustrate clear insights into the ways that collaborative prototyping aided thinking in ideation processes and also as ideas were refined. Evidence of the ways that prototypes act as social mediators was also created, showing how verbalisation and discussion were supported and illustrating ways that collaboration was enacted. Material

constraints became apparent in practicalities of prototyping but at the same time it was clear that interacting with materials was also impacting on the children's understanding of materials and their properties and becoming both excited and frustrated by these. In overarching conclusions, the authors draw attention to the pedagogical and theoretical implications of the study, including the extent to which the learners focus was increasingly on creating the prototype, not on developing their design ideas and how this could potentially be mitigated by clear goals and constraints that could focus attention on the design challenge.

Finally, in *Considering the relationship between research and practice in technology education: A perspective on future research endeavours,* Niall Seery, **(**Athlone Institute of Technology, Ireland**),** Richard Kimbell, **(**Goldsmiths, University of London, UK**),** Jeffrey Buckley, (Athlone Institute of Technology, Ireland & KTH, Stockholm Sweden) and Joseph Phelan, (University of Nebraska, Lincoln, USA) focus on developments in researching design and technology education over the last 30 years, using the history of two related research groups as a core narrative. They begin by providing an overview of current situations in design and technology education in schools, from an international perspective and of how, variously, traditional vocational and craft oriented education has evolved over time towards approaches that vary between design and technological literacy, capability and perspective. Difference has caused confusion along with critique of a perceived lack of explicit epistemological boundary – seen as both a negative and a positive. The article supports a need and focus for future research agendas by presenting the evolution of research conducted by two major research groups in the international community – TERU (Technology Education Research Unit) founded in 1990 and TERG (Technology Education Research Group) founded in 2010. An overview of the history of the research of the two groups is outlined, along with how they became collaborators, developing and extending understanding of teaching, learning and assessment research in technology education. The article also draws on related research from the international community and indicates how the nature of the more than 30 years of research has shifted in terms of both issues of concern and methods of research that collectively provide a legacy to scaffold future research agendas across the community.

 As one of the editors of this journal, Kay has to declare an interest in this article – not as one of the authors but as one of the founder members of TERU.

As an endnote to this editorial we should mention that this issue contains no reflection piece or book review – normal service will be resumed in the next Issue!