Guest Editorial - Cultivating emerging research agendas from the PATT community

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This special section is comprised of submissions that originated at the 2018 Pupils Attitudes Towards Technology (PATT) conference and supports the further articulation of thinking and research that was presented at the event.

For us, the PATT 36 conference in Athlone, Ireland was a significant milestone for the Technology Education Research Group (TERG). It was a point of reflection that allowed us to recognise the culmination of our endeavours and the level of development since our inception in 2010. It allowed our emerging talent (specifically PhD students) shape the focus of the conference and helped define a clear rationale for their own research agendas and how it supplements, challenges, or re-orientates the contributions and evidence to date. For TERG, being part of the PATT community is strategically important as it provides support for dissemination, networking, critique, and advice, but more importantly the PATT 'family' is about recognising and developing people with a shared interest in developing technology education. TERG emerged through an agenda of building a research culture and developing expertise and is underpinned by a philosophy best captured by the old Irish proverb, "Mol an óige agus tiocfaidh sí" - praise the young and they will flourish. It is this sentiment that sustains PATT endeavours!

PATT36 has had an immeasurable impact on the TERG members and for that we are very grateful.

The theme of the conference, *Research and Practice in Technology Education: Perspectives on Human Capacity and Development*, evolved from previous conferences and research produced by the community over a period of time and focused on the utility of research in enhancing practice. This focus framed an overarching agenda that attempted to capture the fullness of human capacity while maintaining a commitment to supporting personal development. Sub-themes were conceived to capture the essence of the role and importance of technology education and authors were invited to present works that focused on the following themes:

- Cultivating Imagination and Innovation
- Learning through Design and Make
- Driving Social Change

We invited interested stakeholders to attend the conference and access the conference proceedings to give visibility to the comprehensive contributions and developments in

technology education made at this conference. The following section outlines a number of papers that represent a 'snapshot' of the contributions.

The selected papers from PATT36 were chosen to demonstrate the breadth and relationships between research agendas, which remains the core strength of the PATT community. The contributions frame a sample of the research enquiry and take us through a journey from the very definition of design and technology education, its manifestations, and how various interpretations still resulted in similar issues and challenges. They also present how our response as researchers has helped evolve contemporary research agendas. The following papers have contributed to the conference theme of Research and Practice in Technology Education: Perspectives on Human Capacity and Development.

We begin with interesting work in the UK, authored by Matt McLain, Dawne Irving-Bell, David Wooff and David Morrison-Love. The paper entitled *'Humanising the design and technology curriculum: why technology education makes us human'*, helps set the scene for defining the nature of technology education. This paper explores the origin and theoretical underpinnings of Design and Technology (D&T) and advances the discourse on the potential and function of D&T education. The paper sets the baseline of an evolving research agenda that will help shape at a fundamental level how we describe design and technology education in the future. Although the context for the paper is in the UK framing of the subject, it has implications for the international discourse as we all endeavour to advocate for technological education. The systemic and political tensions are referenced and should be considered subject to the fundamental positioning of D&T. The importance of the cultural and historical perspectives are emphasised and a position taken to reframe the relationship with technology and society. This by virtue promotes D&T as fundamentally human.

The concept of a humanising experience that is culturally sensitive, brings with it one of the most significant challenges in technology education. The variance in participation rates by gender is a complex and long standing research agenda for the PATT community. This challenge is tackled by researchers in Sweden with their paper *'Girls' engagement with technology education: A scoping review of the literature'.* This research agenda focuses on access to technology education while emphasising how perceptions are impacting access.

Ulrika Sultan, Cecilia Axell and Jonas Hallström present the findings from their scoping literature review, highlighting the research agenda, methodological approach, and the critical issues relevant to girls' engagement with technology. Worryingly, the majority of studies report that girls are more reluctant to participate in technology, science and/or STEM fields, less interested in the subject and more negative towards technology (education) than boys. The gender difference is framed and discussed in the paper and highlights the societal and cultural influences that contribute to the origin and possible sustained variance defined by the expectations and definition of male and female roles. Importantly, this paper questions the nature of the technological activity and the relationship between girls and tasks and activities that are relevant to the development of technological literacy and capability. This reference of 'near to practice' research will certainly ensure new insights but also enable us to consider the cultural and societal factors that may amplify or filter the agenda of ensuring the fundamentally human orientation of D&T.

It is arguable that much of the legacy perspective or interpretation of technology subjects originates from the vocational intention. In many countries this resulted in a curricular articulation of the elements of technology education. Typically, *Textiles and Food, electronics* and *resistant materials* were separated by a historic and vocational agenda that reinforced perceived gender orientations. The work of researchers in Finland, Juha Jaatinen and Eila Lindfors titled *'Makerspaces for Pedagogical Innovation Processes: How Finnish Comprehensive Schools Create Space for Makers'*, has focused, not on the issue of gender, but the significance of the learning activity and learning environment. Sensitive to the cultural importance of craft education, this research elaborates on the importance of the maker space in the context of a contemporary learning agenda. The importance of the contribution is in highlighting the move from an emphasis on production in a maker spaces towards more meaning-making in the application of knowledge and skills. This work takes a contemporary look at craft skills and the importance of the relationship between designing and making in the acquisition and development of innovation. This focus on activity again frames a useful research agenda that has the potential in the future to contribute to the fundamental understanding of the importance of design and technology activity.

The strength of the PATT community is support for the evolution of thinking. This has resulted in the iterative visiting of core issues in design and technology, but also evolutions and synergies in the way researchers are redefining the research effort. The importance of building on sound empirical evidence both within and beyond D&T supports a useful agility in emerging research and researchers. The paper titled *'Children's Responses to Divergent and Convergent Design Feedback'* by Alice Schut, Remke Klapwijk, Mathieu Gielen and Marc de Vries builds on the evidence of feedback as a critical dimension of contemporary provision and highlights its importance in the context of design activity. This agenda further developed the classification of divergent and convergent feedback as it applied to the objective of moving the learning forward. The insight that has developed from the basic enquiry is framed from the perspective of pedagogical practice with an emphasis on how we must think about how our actions as teachers may impact on learners. The need for all involved in the educational transaction to become more skilled in giving and receiving feedback and the need for more openness in relation to feedback conversations is presented.

It is hoped that this special section captures in some way the significance of the PATT community to the advocacy of design and technology education and highlights the emerging research agendas and talent that is supported in this community. It is also hoped that it encourages and informs researchers, teachers and other stakeholders that engage with PATT at an exciting time for our community.

It was a privilege for us to edit this special section and we would like to thank the PATT community for making PATT36 (and all PATT conferences) a very special memory for us. We would like to thank the authors for their contributions and ensuring that the future of PATT remains bright. And finally, a sincere thank you to Professor Kay Stables for her guidance and expertise as we developed this special section.