A New Era for Design and Technology Education Research

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Journal developments

Since the publication of the last issue of the Journal, the Editorial Board has begun to explore development opportunities that will improve the distinctiveness, visibility and value of this International Journal for Design and Technology Education.

The Board has agreed an updated 'scope' for the Journal, taking account of the broadening of contributions both from higher education, a more global spectrum of contributors and the uniquely broad and inclusive platform the Journal now provides. Board members themselves will take a more proactive role in development, for example in promoting the Journal and mentoring new reviewers and authors. A review of the expertise of the current Editorial Board has highlighted the need for an increased spread of expertise and also for the introduction of an additional panel of peer reviewers. Anyone interested in making a greater contribution as a peer reviewer or as an Editorial Board member should contact Liz Hegan, the Journal's Administrator (liz.hegan@data.org.uk) in the first instance.

The review process itself is also being developed, first to move to a position where articles are peer reviewed by a minimum of two reviewers with additional peer review being undertaken on the decision of the editors, for example where there is distinct disagreement between two reviewers or where a third less experienced reviewer is being introduced to the process. The second development is the move to an online Open Journal System that should increase efficiency and speed up the review process. We anticipate this system to be fully introduced early in 2017.

In recent years the Journal has regularly published Special Issues, linked to conferences or themes proposed by Editorial Board. These will continue but we are also keen to receive proposals for Special Issues from readers and contributors. These should be sent to one of the editors in the first instance (k.stables@gold.ac.uk or E.Bohemia@lboro.ac.uk).

We are also exploring ways of making the Journal more visible, for example by making more explicit links between the Journal and other D&T Association resources, increasing the Journal's presence on the Internet and maximising opportunities to present research to a broader audience, for example by including abstracts of research articles written directly for practitioners.

We would welcome further ideas and comments on increasing visibility and on other aspects of development from the Journal's contributors and readership. For further updates, watch this space!

Introducing Issue 21.3

This final Issue for 2016 provides six research articles that provide insights across Design and Technology Education from Early Years to Higher Education.

We start with a historically focused article that explores the ways in which industrial design education has developed in Australia. In *Institutionalising design education and design promotion in Australia – from early British influences to wider international engagement,* Simon Jackson explores the roots of industrial design education going back to the early 19th Century and the introduction of technical education, linked to the development of the Australian manufacturing industry. Charting changes from the early institutions providing technical skills up to the introduction of industrial design as a course of study in higher education, he shows how early influence of British design education could be seen not just in technical education of apprentices but also in schools' education. He then highlights how other influences, such as the Bauhaus, allowed a break with more traditional approaches and then how Australia's professional associations such as the Society of Designers for Industry introduced further modernising ideas. In a fascinating account he provides the story of how a "discipline with no name" became a professional discipline of industrial design, exploring the contexts and influences of change throughout the whole educational system.

Moving from an historical story of Industrial Design Education to a story for its future, the second article explores introducing new technological dimensions into curricula. In *Opinions on the Internet of Things in the Industrial Design Curriculum*, Tom Page explores possibilities presented by including the Internet of Things as a subject of study in Higher Education, although the questions raised and the approaches explored offer insights more broadly across phases of education. Through the article he introduces the concept and its development and rapid growth, identifying some of the beliefs about its potential alongside a more critical consideration of the challenges and risks that are created. He identifies a situation in which growth is massive and excitement of possibilities abound, but in which designers are, so far, not playing a major role. He also points to

research indicating that this needs to be addressed and so turns to the role of Design and Technology education, specifically in his article that of Industrial Design Education. Illustrating the lack of explicit focus currently in design programmes he presents a small scale research project undertaken with undergraduate design students and design academics. While he found a recognition of the importance of the Internet of Things for new designers and enthusiasm for integrating it into curricula, this was, interestingly, greater amongst Bachelor of Science Design students than those studying for Bachelor of Arts Design degree. The article concludes with suggestions for implementation.

Keeping a focus on ways in which technological developments influence curricula, but shifting to a younger age group, Auli Saarinen, Pirita Seitamaa-Hakkarainen, Kai Hakkarainen present *The Functions and Benefits of the ePortfolio in Craft Education at the Primary Level*, exploring the use of ePortfolios with young learners in Finland. Their article is drawn from a research study that focused on a group of learners who had used ePortfolios for three years, starting when they were in Grade 3 (age 8-9). Working in the context of Craft Education from the new Core Curriculum for Basic Education, they addressed questions of the pupils' experiences of the functions and educational benefits of using an ePortfolio in Craft Education. Working on iPads with an application that was not web-based, the learners documented their craft projects through photographs and commentary and teachers added formative assessment feedback through text directly into the portfolios. For the research, data was collected through stimulated recall semi-structured interviews – with the learners' own portfolios acting to stimulate the learners' thoughts and memories of using an ePortfolio. The researched indicated the value of learners gathering authentic evidence of their own work in this way. Amongst the findings it emerged that learners gained confidence in their ICT capability and also ownership of their learning process, with strengthened memory in terms of how they remembered their processes and knowledge learned. The authors concluded that, if started at an early age, ePortfolios are a workable approach in Craft Education.

Staying with young learners the next article moves us to the Netherlands. In *Groundwork: Preparing an effective basis for communication and shared learning in design and technology education,* Annemarie Looijenga, Remke Klapwijk and Marc J. de Vries present a study undertaken with 4-8 year old children that explored using interaction with children as groundwork in the early stages of a project, structured through 5 components: context, communication, integration of acting and thinking, presenting instructions and presenting a problem. Drawing from recent developments in the Dutch D&T curriculum, the authors had a focus on design learning and problem solving and the readiness of children for this that evokes 'wonder'. A particular concern was to see if the approach could address the common problem in D&T of either too wide a project focus that learners are lost in or too tight a focus that entails too much teacher direction. Through the study presented they show two approaches that were experimented with, the first with 4-6 year olds focusing on self expression through shared perceiving skills and shared language, the second with 7-8 year olds focusing on self expression through hands-on learning. The article presents the classroom approaches used with the learners and their findings indicate that the use of the five components in the groundwork avoid the problem of too tight or too loose a project. They also provide insights into the high levels of engagement and motivation amongst the children, with reduced direction from the teacher in exploring and creating processes and the value of effective communication on transforming individual knowledge into shared knowledge. From both case studies, group work combined with free choice on experimentation and individual and collaborative activity was valuable but they found a difference between the two approaches wherein vocabulary was increased in the first case study through daily practice in verbalizing what children perceived as compared to the second where this was not included and the children were less able to express what they were doing. The authors conclude by making practical recommendations, based on their research.

The final two articles focus on secondary D&T in England. In the first, Mary Southall presents research from a study that investigated the relationship between intended and actual learning in D&T. In '*What does Design and Technology learning really look like?* Mary analyses teachers' planning for learning and the actual learning outcomes anticipated (in terms of where learning would be evidenced) and comes to the conclusion that planning and progression in D&T is complex. Questioning the effectiveness for D&T of the dominant linear, "rationalistic, technical curriculum planning" prevalent in schools in England and Wales, she explores alternative models that are more 'organic' or 'naturalistic'. She also opens up particular features of D&T that are problematic in the context of linear approaches, such as the the 'wicked' nature of problems or tasks in designing that have no correct, set solution and the consequence of this for a recognition that knowledge and skills cannot be pre-defined as they will arise through the development of ideas on a need-to-know basis. Through the study she

analyses seventy D&T lesson plans for use with 11-14 year olds and finds that none of the declared intended learning outcomes focus, for example, on higher order thinking. In analysing how and where the teacher anticipates the learning to be evidenced she identifies a narrow, tangible range and questions the balance of control between the teacher and learner in the ways that forms of knowledge are pre-specified. She concludes that student-led learning needs to replace teacher direction, including authentic tasks, iterative and user centred approaches and student ownership of learning outcomes in order to see what D&T learning really looks like.

Finally, Gwyneth Owen-Jackson and Marion Rutland present an analysis and distinctly political critique of the history of learning and teaching related to food. In *Food in the school curriculum in England: its development from cookery to cookery,* they trace the history of justifications for and approaches to teaching about food in a story that starts with the introduction of teaching girls to cook in the 19th century, justified by improving the health of their family and of the nation and, as the title of the article suggests, recount a story that has come full circle where the focus on teaching food in England has become once again, from a political perspective, about the health of the family and nation. They pinpoint critical developments over a history of nearly a century and a half, showing how political rather than educational ideology has often been the impetus for change. They focus on recent history that saw food become firmly embedded in D&T for all children from 5-16 with the introduction in 1990 of the National Curriculum and how this has been eroded with recent shifts to make cookery, once again, the main focus in compulsory schooling. Within this they highlight the challenges this creates within the established D&T profession and also for industrial societal needs, where career routes have been drastically curtailed. They draw on research, including the body of research they have created themselves, that spotlights the changes and that opens up a broader, more educational perspective on the value of learning and teaching about food, in their words "enriching the lives of children in the 21st century in practical, intellectual and social domains". Whilst being a story of a very specific nature, the analysis and critique presented illustrate a valuable lens through which to view the issues and challenges that, as educators, we are faced with as we strive to maintain an educative focus as the priority of learning and teaching.

As usual, the issue also includes a reflection piece and a book review.

In the reflection piece, Richard Kimbell ponders, in his time honoured fashion, on certain current events and how these can be used to view matters of significance in Design and Technology Education. Two matters have drawn his attention recently. The first links to his views on assessment and to the current spelling and grammar tests that all 11 year olds are required to take in England. The second links to a recent publication about the importance of education developing children as problem solvers. We leave readers to explore his musings on these matters and to find the links to Design and Technology and the irony presented through his analysis.

Finally, David Wooff has reviewed the recently published *Design Thinking for Education: Conceptions and applications in teaching and learning* by J.H.L Koh, C.S.Chai, B. Wong and H.-Y. Hong – a book that explores design thinking in the context of children and pre-service and in-service teachers, exploring how it can be integrated into teaching and learning contexts.