Editorial 26.2

Less *Generation Z*, more *Jumanji*

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Welcome to the second issue of the journal for 2021. As we enter what will hopefully be the final chapter of the current pandemic (although we seem to recall that we said exactly the same thing back in the last DATE editorial four months ago), this issue provides opportunities for sharing recent research alongside some speculation about how things might change, what lessons have been learned, and what future research may focus on. The issue includes five research articles, a reflection piece and a book review. The research articles fall broadly into two categories with the first two reporting on research into the implementation on digital technologies in design and technology classroom activities whilst the final three articles are more focused on pedagogy, with the final two articles focused on undergraduate industrial and product design learning and teaching approaches.

The last year has shown us what living through a global pandemic is really like, and surprise, surprise it's not much like what Hollywood predicted. Gun toting virus infected monkeys (*Dawn of the Planet of the Apes*, 2014) and a zombie dodging Brad Pitt (*World War Z,* 2013) are nowhere to be seen, although London did look reminiscent of a scene straight from Danny Boyle's 2002 film *28 Days Later* for most of 2020. What has been most people's reality, especially for those of us working in education, has been a year spent learning and applying new learning and teaching technologies, fighting for limited resources, and dealing with the inevitable and very real human issues, both our own and those of others around us. In this issue's reflection piece Deborah Winn compares the difficulties faced by teachers of practical subjects in the last year or so as like being in the rope bridge scene in the 2019 film *Jumanji: The Next Level*, having to move forward at all costs while being chased by psychotic monkeys. We are sure that we can all empathise with her. So while Hollywood may have got it wrong in their many depictions of post pandemic scenarios, we can perhaps all agree that there are some movie scenes that seem to fit the bill quite well, hence the title of this editorial (it does rhyme if you say it in an American accent, which we are sure you have all have done in your heads). Hopefully this issue will provide us with some food for thought and allow us to reflect on our own educational practices as we consider how best to approach the next stage of this saga.

The first research article focuses on the use of augmented reality (AR) in practical classroom situations. In *Using augmented reality (AR) in vocational education programs to teach occupational health and safety (OHS)*, Renk Hülagü and Önder Erkarslan from Izmir Institute of Technology, Turkey present research from a study into the teaching of occupational health and safety (OHS) in Turkey within secondary schools and universities, with a view to designing a new system of teaching OHS using AR to raise awareness of risk, make students more cautious and appreciative of the task at hand, and therefore hopefully reduce accidents. They discuss

the need for students to experience risk in order to develop safe working methods in workshop activities and an appreciation of precautions and safety measures. The case study experiments

were conducted with few changes to work practices or existing machines and workshop set ups, and the systems used received positive feedback from students, with a noticeable decrease in potentially dangerous mistakes and fewer students in both control groups forgetting their PPE or using it incorrectly. The authors discuss the potential development of a low-cost AR OHS training system using a projector mounted over a lathe which may be an interesting project to develop within the Design Technology community, especially when student's hands on machine time and therefore their exposure to risk may be increasingly limited due to a number of external factors.

In *ePortfolios in craft education at the primary level: Teachers' experiences on ICT integration,* Virva Törmälä from Tampere University, Finland discusses the effects of the 2016 introduction of the Finnish National Core Curriculum (NCC) and its encouragement of pupils documenting their craft working practices. This study looks at the challenges of implementing an electronic portfolio (ePortfolio), and ICT more broadly, for craft education in a Finnish primary school context. The NCC encourages the use of digital technology to document pupil's working processes and digital documentation more widely. Using multimodal content on an iPad it is evident that the initiative is a useful and timely introduction to digital documentation and a useful way to map pupil progress in their craft activities, but there were several problems with the ICT implementation, the tools themselves and the differing level of digital literacy among the participants. While it is encouraging to see the Finnish NCC pushing the introduction and development of digital technologies it is evident that there remain barriers to their successful use at primary level. The use of ePortfolios in craft education, especially at primary level, could still prove to be a very useful and interesting development and this is a promising area of research for ICT and Design Technology educators.

In *The Reciprocal Nature of Pedagogical and Technical Knowledge and Skill Development between Experts and Novices,* David Gill from Memorial University of Newfoundland, Canada discusses what impact an expert teacher's pedagogical and technical knowledge and skill may have on their students, in this case technology education student teachers. By looking at the tutor student relationship in traditional wood boat building workshops in Newfoundland and Labrador, Canada, David traces the link between expert and novice in knowledge transfer and skill development and the importance of fostering and mentoring activities in the learner teacher relationship. By considering what it means to be an expert and how novices tend to use reductionist or heuristic techniques to simplify their experiences, we can begin to consider how students move from novice to mastery of a subject. The importance of having or gaining a real practical understanding and experience of the techniques of the task in hand is a prominent theme, along with how the technical perceptions of the instructor and the student can vary. Although the case study is based on a very specific craft context, that of traditional boat building, the student teachers reported that they were constantly thinking about how this experience could be applied to their own classroom situations in the future, not least in how it helps to structure and compartmentalise tasks. The importance of relationship building and of reflection in the task is stressed, as is the need to consider practical hands-on activities that

make students consider the formulation of teaching and learning. By considering new and different learning environments and activities for student teachers perhaps we can help them develop greater technical knowledge as well how the reciprocal relationship between expert and novice can shape their pedagogical practice.

In *Embedding Design Sprint into Industrial Design Education*, Ozan Soyupak from Osmaniye Korkut Ata University, Turkey explores the use of design sprints as a mechanism for students to explore their design and creative thinking through rapid innovation. The article discusses the shift in product and industrial design from physical to beyond physical, and how design sprints can be used in a wide variety of situations where innovation is a key required outcome. By focusing on design thinking as a human-centred problem-solving approach, Ozan traces the development of design thinking methodologies and frameworks, and design sprints in particular, and how these can be applied in an educational setting. While design sprints can be used across many areas of the curriculum, including in ICT and computer science, by comparing the concepts of design thinking and design sprints we can begin to understand the traditional relationship between industrial design educational practices and those of the profession. A three and a half day intensive design sprint workshop was held for undergraduate Industrial Design students where students determined the subject of the design sprint. Design sprints allow students to explore a design study using a well-defined structure with an experienced facilitator, and although the results appear similar to those of more traditional studio-based practices, the students reported a less hierarchical and more democratic approach to the task, with a more collective feel to the work and a feeling of independence through the activity. They also appreciated the close link between and within other actors in the design activity and, as such, the students began to more fully appreciate the multidisciplinary nature of the process.

The final research article in this issue continues the focus on higher education industrial and product design pedagogy and curriculum. *Phenomenological Approach to Product Design Pedagogy: A Study on Students' Experiences in Interdisciplinary and Intercultural Settings,* Fausto Orsi Medola, Luciana Ramos Baleotti, Aline Darc Piculo Santos, Ana Lya Moya Ferrari, and Amanda Coelho Figliolia from São Paulo State University (UNESP), Brazil and Nenad Pavel from Oslo Metropolitan University, Norway discuss the use and importance of design critique in design studio education, and how it can cause misunderstandings in interdisciplinary and intercultural teams. A four week study looked at undergraduate students of product design and occupational therapy in Norway and Brazil working on a project that targeted the demands of people with disabilities. The authors note the perceived importance of experience in product design education – the emphasis on students being able to do it (practice design) rather than theorise about it, and that designers tend to be generalists with a wide knowledge base to allow for creative inspiration. While critiques have traditionally been used to facilitate critical thinking in the design studio, the authors suggest that a move towards more immersive design learning spaces are better suited to develop real world skills and behaviours. The focus on design for people with disabilities, and collaboration with rehabilitation professionals, allows students to focus on user centred design and empathic practices within an inclusive design framework. By looking at the student expectations and their evaluation of experience and engagement it became clear that the use of a co-design process methodology, in collaboration with users and other members from other professions, led the students to be more creative and innovative. By focusing on the affordances and constraints of the interdisciplinary design process, rather than the critical reflection of constructed knowledge of the traditional critique,

it is hoped that the learning environments become richer and a greater focus on learner immersion in the task at hand may be the most beneficial learning outcome of this approach.

In addition to the research articles, this issue also includes a reflection by Deborah Winn of Neale-Wade Academy, UK and Daniela Schillaci-Rowland of Presdales School, UK and a review of a recently released book from the Center of Excellence for Technology Education (CETE).

In *Reflections on teaching Design and Technology in a pandemic*, Deborah Winn and Daniela Schillaci-Rowland reflect on the challenges faced by design and technology educators in 2020/21 in two different school settings. In what is our first reflection piece by practising Design Technology teachers in the DATE journal, Deborah and Daniela remind us of the rapid production of 650,000 items of PPE by Design and Technology departments across England while the constant change of rules and advice left them feeling like characters in Jumanji. While the authors report on the many challenges of the rapid shift to digital teaching and learning, not least the production of appropriate resources and the associated increase in workload from learning new technologies, it is evident that some students and teachers responded very positively to the shift, and a renewed focus on creativity and the learning opportunities offered to students may be very positive outcomes for the future development of the subject.

Finally, we have a review from Jonas Hallström from Linköping University, Sweden of the recently published book by the Center of Excellence for Technology Education (CETE) *The Impact of Technology Education: International Insights* edited by Marc J. de Vries, Stefan Fletcher, Stefan Kruse, Peter Labudde, Martin Lang, Ingelore Mammes, Charles Max, Dieter Münk, Bill Nicholl, Johannes Strobel, and Mark Winterbottom.

We hope that you enjoy this issue.