## CONFERENCE SCHEDULE

# Monday 18th June

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| **8:00 - 8:10** | **Travel via bus to AIT** | |
| **8:10 - 9:00** | **Registration** | |
| **9:00 - 9:15** | **Conference Opening:**<br>Registrar and President AIT | |
| **9:15 - 9:30** | **Keynote:**<br>Minister for Higher Education- Minister Mary Mitchell O'Connor | |
| **9:30 - 10:00** | Welcome and Schedule:<br>Dr. Niall Seery and Prof. Marc J. de Vries | |
| **10:00 - 10:30** | **Break and Refreshments** | |
| **Parallel Sessions 10:30 - 12:10** | **Session 1:**<br>**X103 Engineering Building**<br>**Chair: Donal Canty** | **Session 2:**<br>**Y103 Engineering Building**<br>**Chair: Rónán Dunbar** |
| **10:30 – 10:55** | Rethinking Pupil's Attitudes Towards Technology (PATT) Studies<br>**Piet Ankiewicz**<br>(pg. 1 - 8) | Technology teachers' different ways of thinking about sustainable development in technology education<br>**Maria Svensson and Anne-Marie van Otter**<br>(pg. 33 - 39) |
| **10:55 – 11:20** | Woman's under-representation in STEM: The part role-models have played in the past and do we still need them today?<br>**Stephanie Atkinson**<br>(pg. 9 - 15) | What technology content and values emerge in the teaching of climate change?<br>**Susanne Engström**<br>(pg. 40 - 46) |
| **11:20 – 11:45** | Changing Competencies, Changing Attitudes? How Teachers Become Technology Teachers<br>**Brigit Fahrman, Per Norström and Lena Gumaelius**<br>(pg. 16 - 22) | Technological thinking by children with special needs<br>**Michal Levi and David Mioduser**<br>(pg. 47 - 58) |
| **11:45 – 12:10** | A Global Analysis of how High School Activities are Preparing Students for the 21st Century<br>**P. Scott Bevins Virginia Jones and Daniel L. Trent**<br>(pg. 23 - 32) | Mitcham's Fourth: a case for foregrounding volition when framing Design and Technology Education<br>**Steve Keirl**<br>(pg. 59 - 64) |
| **Parallel Sessions 12:10 - 13:25** | **Session 3:**<br>**X103 Engineering Building**<br>**Chair: David Barlex** | **Session 4:**<br>**Y103 Engineering Building**<br>**Chair: Sheryl Sorby** |
| **12:10 – 12:35** | Using linkography to explore novice designers' design choices during a STEM task<br>**Nicolaas Blom, Grietjie Haupt and Alfred Bogaers**<br>(pg. 65 - 70) | Kindergarten programming goes mobile<br>**Asi Kuperman, Ruthi Aladjem and David Mioduser**<br>(pg. 81 - 87) |
| **12:35 – 13:00** | Conceptualisation Processes and Making<br>**Antti Pirhonen**<br>(pg. 71 - 75) | Learning science and technology from play in early childhood education<br>**Hanno van Keulen and Mariska Venema**<br>(pg. 88 - 95) |
| **13:00 – 13:25** | The Delft research programme on design for concept learning<br>**Marc J. de Vries**<br>(pg. 76 - 80) | STEM in Northern Ireland Primary Schools: Where is it at, and where should it go?<br>**Kieran McGeown and Michael Ievers**<br>(pg. 96 - 102) |

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| **13:25 - 14:15** | **Lunch** | |
| **Parallel Sessions 14:25 - 15:40** | **Session 5:**<br>**X103 Engineering Building**<br>**Chair: John Williams** | **Session 6:**<br>**Y103 Engineering Building**<br>**Chair: Eva Hartell** |
| **14:25 - 14:50** | STEM Associational Fluency: The Cross-Training of Elementary and Middle Grade Math, Science, and Engineering Pre-Service Teachers<br>**Elizabeth Deuermeyer and Michael de Miranda**<br>(pg. 103 - 115) | From High to Low Voltage: A genre approach for teaching to write about designing<br>**Gerald van Dijk, Sacha Tippel and Maaike Hajer**<br>(pg. 132 - 139) |
| **14:50 - 15:15** | Innovating a professional technology teaching programme based on student teachers' expectations and experience of work-integrated learning<br>**Werner Englebrecht**<br>(pg. 116 - 122) | Making it work: A case study of Canadian intermediate technology educators' pedagogical classroom practice<br>**David Gill**<br>(pg. 140 - 147) |
| **15:15 - 15:40** | Considerations for developing integrated-stem courses at the senior secondary school level in New Zealand<br>**Bruce Granshaw and Cedric Hall**<br>(pg. 123 - 131) | Supporting Discourse using Technology-Mediated Communication: The Community of Inquiry in Design and Technology Education<br>**Adrian O'Connor, Niall Seery and Donal Canty**<br>(pg. 148 - 155) |
| **15:40 - 15:45** | **Break and Refreshments** | |
| **Parallel Sessions 15:45 - 17:00** | **Session 7:**<br>**X103 Engineering Building**<br>**Chair: Brian Bowe** | **Session 8:**<br>**Y103 Engineering Building**<br>**Chair: Lena Gumaelius** |
| **15:45 - 16:10** | Innovating an Initial Professional Education of Technology Teachers (IPETT) programme<br>**Rina Grobler**<br>(pg. 156 - 166) | Constructs of Quality and the Power of Holism<br>**Richard Kimbell**<br>(pg. 181 - 186) |
| **16:10 - 16:35** | Developing Technology Student Teachers' Volition Through Curriculum-Related Excursions<br>**Francois Van As**<br>(pg. 167 - 174) | Exploring the Potential for Identifying Student Competencies in Design Education through Adaptive Comparative Judgment<br>**Scott Bartholomew, Emily Yoshikawa and Pat Connolly**<br>(pg. 187 - 194) |
| **16:35 - 17:00** | Making industrial internships effective for the professional development of aspiring science teachers<br>**Mandy Stoop and Rutger van de Sande**<br>(pg. 175 - 180) | Implications of the Learning Sciences for the Unique Intent and Remit of Technology Education<br>**Joseph Phelan, Niall Seery and Donal Canty**<br>(pg. 195 - 200) |
| **17:00 - 17:15** | **Travel via bus to conference hotel** | |
| **18:15 - 19:30** | **Social Activity:** Walking Tour of Athlone | |
| **19:30** | **Social Activity:** BBQ at Sean's Bar with Traditional Irish music session | |

# Tuesday 19th June

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| **8:30 - 8:40** | **Travel via bus to AIT** | |
| **9:00 - 10:0 X103 Engineering Building** | **Plenary Session 1: Chair - Niall Seery**<br><br>**Theme 1 – Cultivating Imagination and Creativity**<br><br>**A keynote address will be delivered by Sean Ó Broin, former Assistant Head of the State Examinations Commission. This will be followed by a plenary discussion.**<br><br>**Discussion Panel – Sean Ó Broin, Kay Stables, Joe Phelan** | |
| **10:10 - 10:30** | **Break and Refreshments** | |
| **Parallel Sessions 10:30 - 11:45** | **Session 9:**<br>**X103 Engineering Building**<br>**Chair: Jeff Buckley** | **Session 10:**<br>**Y103 Engineering Building**<br>**Chair: Kay Stables** |
| **10:30 – 10:55** | Speculative Writing: Enabling Design Thinking<br>**Belinda von Mengersen**<br>(pg. 201 - 206) | Cultural and historical roots for design and technology education: why technology makes us human<br>**Matt Mclain, Dawne Bell, David Wooff and David Morrison-Love**<br>(pg. 223 - 230) |
| **10:55 – 11:20** | Developing Creativity and Imagination in Native Hawaiian Adolescents<br>**Toni Marie Kaui, Kamalani Doria, Kainalu Gomera, Samuel M. Kamakau IV, and Quinn Waiki**<br>(pg. 207 - 215) | Girls' engagement in technology education: A systematic review of the literature<br>**Ulrika N. Sultan, Cecilia Axell and Jonas Hallström**<br>(pg. 231 - 238) |
| **11:20 – 11:45** | Connecting Authentic Innovation Activities to the Design Process<br>**Joachim Svärd, Konrad Schönborn and Jonas Hallström**<br>(pg. 216 - 222) | Teacher students' critical thinking skills using the concept of disruptive technologies<br>**Cecilia Axell and Lars Björklund**<br>(pg. 239 - 245) |
| **Parallel Sessions 11:45 - 13:00** | **Session 11:**<br>**X103 Engineering Building**<br>**Chair: Joe Phelan** | **Session 12:**<br>**Y103 Engineering Building**<br>**Chair: Steve Keirl** |
| **11:45 – 12:10** | Investigating T/E Design Based Learning: Student Ability to Select and Utilize STEM Content and Practices<br>**Susheela Shanta and John G. Wells**<br>(pg. 246 - 255) | Supporting Learning Design Language in Primary Education<br>**Miroslava Silva Ordaz, Remke Klapwijk and Gerald Van Dijk**<br>(pg. 270 - 277) |
| **12:10 – 12:35** | On Intelligence in Technology Education: Towards Redefining Technological Capability<br>**Jeffrey Buckley, Niall Seery, Donal Canty and Lena Gumaelius**<br>(pg. 256 - 262) | Attention and Action during the Design and Technology lesson: by fine-tuning of task characteristics<br>**Annemarie Looijenga, Remke Klapwijk and Marc de Vries**<br>(pg. 278 - 287) |
| **12:35 – 13:00** | Investigating the Relationships between Spatial Ability, Interest, and Task Experience on Knowledge Retention in Engineering Education<br>**Tomás Hyland, Jeffrey Buckley, Niall Seery, Jason R. Power and Seamus Gordon**<br>(pg. 263 - 269) | Interdisciplinary teaching in Swedish primary schools: Teachers' perspectives of subject-matter integration in technology and history<br>**Catherine Couturier, Lars Geschwind and Eva Hartell**<br>(pg. 288 - 294) |

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| **13:00 - 14:00** | **Lunch** | |
| **Parallel Sessions 14:00 - 15:15** | **Session 13:**<br>**X103 Engineering Building**<br>**Chair: Adrian O'Connor** | **Session 14:**<br>**Y103 Engineering Building**<br>**Chair: Niall Seery** |
| **14:00 – 14:25** | A preliminary model of problem categorisation to explore the cognitive abilities required for problem solving in engineering education<br>**Clodagh Reid, Rónán Dunbar and Jeffrey Buckley**<br>(pg. 295 - 301) | Teachers' Views on Training Spatial Skills and Creative Thinking by Using Model Construction. - A Case Study from South Korea and Sweden<br>**Lena Gumaelius Mariana Black and Tom Callen**<br>(pg. 319 - 326) |
| **14:25 – 14:50** | Pupils' Goal Orientations in a Pedagogical Innovation Process: A Competition to Design and Manufacture Quick Hydrocopters<br>**Eila Lindfors, Vilma Heinola and Suvi Kolha**<br>(pg. 302 - 308) | Spatial Ability and Approaches to Solving Word Problems in Mathematics<br>**Gavin Duffy, Brian Bowe and Sheryl Sorby**<br>(pg. 327 - 332) |
| **14:50 – 15:15** | Developing a learning environment for innovation learning in craft, design and technology education<br>**Juha Jaatinen and Eila Lindfors**<br>(pg. 309 - 318) | A National Spatial Skills Research & Development Project<br>**Brian Bowe, Rachel Harding, Theresa Hedderman and Sheryl Sorby**<br>(pg. 333 - 340) |
| **15:15 - 15:20** | **Break and Refreshments** | |

| **15:20 - 16:50** | **Workshop Sessions** | | | |
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| | **Workshop 1:**<br>Z103<br>Sheryl Sorby<br>Spatial Ability | **Workshop 2:**<br>X206<br>Niall Murray<br>AR/VR | **Workshop 3:**<br>V109<br>Sean Lyons<br>Additive Manufacturing | **Workshop 4:**<br>X207<br>Enda Fallon<br>ICT |

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| **16:50 - 17:05** | **Travel via bus to conference hotel** |
| **18:00 - 19:30** | **Social Activity:** Viking Boat to Glasson Hotel and Golf Club |
| **19:30** | **Social Activity:** Meal at Glasson Hotel |

# Wednesday 20th June

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| **8:30 - 8:40** | **Travel via bus to AIT** | |
| **9:00 - 10:10**<br>**X103 Engineering Building** | **Plenary Session 2: Chair – Donal Canty**<br><br>**Theme 1 – Learning through Design and Make**<br><br>**A keynote address will be delivered by Paddy Keays, former director of the Professional Development Sservice for Teachers (PDST). This will be followed by a plenary discussion.**<br><br>**Discussion Panel – Paddy Keays, Richard Kimbell, Nicolaas Blom** | |
| **10:10 - 10:30** | **Break and Refreshments** | |
| **Parallel Sessions 10:30 - 11:45** | **Session 15:**<br>**X103 Engineering Building**<br>**Chair: Tomás Hyland** | **Session 16:**<br>**Y103 Engineering Building**<br>**Chair: Scott Bartholomew** |
| **10:30 – 10:55** | Maker education in the English context<br>**David Barlex and Torben Steeg**<br>(pg. 341 - 346) | Reconceptualising PCK research in D&T education: Proposing a methodological framework<br>**Andrew Doyle, Niall Seery, Lena Gumaelius, Donal Canty and Eva Hartell**<br>(pg. 363 - 370) |
| **10:55 – 11:20** | Better making or making better: Exploring the attitudes of a school community to introducing a forge and blacksmithing into their school<br>**Tony Lawler, Kim Ollif-Cooper, Kay Stables, Dominic Callaghan and Ralph Harris**<br>(pg. 347 - 355) | Investigating the Potential for RGT and ACJ towards deeper insights of Teacher Assessment Practices<br>**Eva Hartell and Helena Isaksson Persson, Scott Bartholomew, Greg Strimel**<br>(pg. 371 - 377) |
| **11:20 – 11:45** | Learning to weld in technical vocational education: the first cycle of an action-oriented study<br>**Nina Kilbrink and Stig-Börje Asplund**<br>(pg. 356 - 362) | Addressing the issue of bias in the measurement of reliability in the method of Adaptive Comparative Judgment<br>**Camila Rangel-Smith and Declan Lynch**<br>(pg. 378 - 387) |
| **Parallel Sessions 11:45 - 13:00** | **Session 17:**<br>**X103 Engineering Building**<br>**Chair: Andrew Doyle** | **Session 18:**<br>**Y103 Engineering Building**<br>**Chair: Richard Kimbell** |
| **11:45 - 12:10** | Pre-service teachers' subject knowledge in secondary design and technology: Findings from an empirical study<br>**Mike Martin**<br>(pg. 388 - 393) | Applying Project Based Learning to Teaching Robotics in Junior-high Schools<br>**Yair Zadok**<br>(pg. 411 - 416) |
| **12:10 - 12:35** | Establishing Progressions of Learning in Engineering for High School Students<br>**Greg Strimel, Michael Grubbs, Tanner Huffman and Scott Bartholomew**<br>(pg. 394 - 399) | Toward an Understanding of Dysgraphia as a Barrier to STEM Related Careers<br>**Daniel Kelly and Deidre Kelly**<br>(pg. 417 - 422) |
| **12:35 - 13:00** | Professional Development Program for Teaching Engineering-Focused Curricula in Technology Education<br>**Kuang-Chao Yu, Szu-Chun Fan and Kuen-Yi Lin**<br>(pg. 423 - 410) | Using a problem solving toolkit – in an international distance learning course<br>**Osnat Dagan**<br>(pg. 423 - 431) |

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| **13:00 - 14:00** | **Lunch** |
| **14:00 - 15:00**<br>**X103**<br>**Engineering**<br>**Building** | **Voices from Our Schools**<br><br>**This session will give delegates an opportunity to get a flavour of the activities and outcomes from the Technology Education subjects in secondary schools in Ireland. A range of project work will be on display from the 8 technology based subjects (4 Junior level and 4 Senior level) on the Irish curriculum. An additional representation of extra-curricular technology related activities will also be presented. You will get opportunity to meet second level students and teachers from the following schools:**<br><br>• **Scoil Mhuire, Kanturk, Co. Cork**<br>• **Portmarnock Community School, Co. Dublin**<br>• **Mercy Secondary School, Ballymahon, Co Longford**<br>• **Coláiste Naomh Cormac, Kilcormac, Co. Offaly** |
| **15:00 - 15:20** | **Conference Tour: Travel to Kilbeggan** |
| **15:20 - 16:20** | **Tour of Kilbeggan Distillery** |
| **16:20 - 16:45** | **Travel from Kilbeggan to conference hotel** |
| **19:30** | **Conference Dinner** |

# Thursday 21st June

## Sessions will take place in the conference hotel

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| **9:00 - 10:10**<br>**Burke Suite** | **Plenary Session 3: Chair – Rónán Dunbar**<br><br>**Theme 1 – Driving Social Change**<br><br>**A keynote address will be delivered by Gerald Crotty, teacher of Technology in Scoil Mhuire, Kanturk Co. Cork. This will be followed by a plenary discussion.**<br><br>**Discussion Panel – Gerald Crotty, Stephanie Atkinson, Ulrika Sultan** | |
| **10:10 - 10:30** | **Break and Refreshments** | |
| **Parallel Sessions**<br>**10:30 - 12:10** | **Session 19:**<br>**Grace Suite 1**<br>**Chair: Tony Lawler** | **Session 20:**<br>**Grace Suite 2**<br>**Chair: Rónán Dunbar** |
| **10:30 – 10:55** | Design Values, Preferences, Similarities, and Differences across Three Global Regions<br>**Scott Bartholomew, Emily Yoshikawa, Eva Hartell and Greg Strimel**<br>(pg. 432 - 440) | Project-based learning in technology education: implications of the digital era<br>**Moshe Barak**<br>(pg. 468 - 474) |
| **10:55 – 11:20** | Implementing Digital Technology in the New Zealand Curriculum<br>**Wendy Fox-Turnbull**<br>(pg. 441 - 452) | Multiple Design Representations to Foster Idea Development<br>**Keelin Leahy**<br>(pg. 475 - 489) |
| **11:20 – 11:45** | A model for food literacy education<br>**Wendy Slatter and Bev France**<br>(pg. 453 - 460) | Teaching young people to respond to a contextual challenge through designing and making – a discussion of possible approaches<br>**David Barlex and Torben Steeg**<br>(pg. 490 - 497) |
| **11:45 – 12:10** | Food Education in the School Curriculum: A Discussion of the Issues, Influences and Pressures on the Teaching of Food<br>**Marion Rutland**<br>(pg. 461 - 467) | Drawings to depict or drawings to explain: A whole-school analysis of children's drawings of bridges<br>**Louise Milne**<br>(pg. 498 - 505) |
| **12:10 - 13:00** | **Lunch** | |

| Parallel Sessions<br>13:00 - 14:15 | **Session 21:**<br>**Grace Suite 1**<br>**Chair: Donal Canty** | **Session 22:**<br>**Grace Suite 2**<br>**Chair: Clodagh Reid** |
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| **13:00 – 13:25** | Effects of Convergent and Divergent Feedback on Creative Thinking During Children's Design Processes<br>**Alice Schut, Remke Klapwijk and Mathieu Gielen**<br>(pg. 506 - 512) | Teaching Sustainability in Technology Education: Perception versus Practice<br>**Beineán Conway, Keelin Leahy and Muireann McMahon**<br>(pg. 521 - 534) |
| **13:25 – 13:50** | Perceptions and reality: Analyzing student experiences in ranking self and peer work through Adaptive Comparative Judgment<br>**Scott Bartholomew, Emily Yoshikawa and Greg Strimel**<br>(pg. 513 - 520) | Scientific and Technological Processes in K-12 classrooms in Quebec Schools: Common Features and Differences<br>**Brahim El Fadil, Abdelkrim Hasni, Joêl Lebeaume**<br>(pg. 535 - 541) |
| **13:50 – 14:15** | | Using Engineering Design Challenges to Promote Imagination and Innovation in Integrative STEM Education<br>**Edward Reeve**<br>(pg. 542 - 550) |
| **14:15 - 14:30**<br>**Burke Suite** | **Closing of Conference- Dr Niall Seery** | |