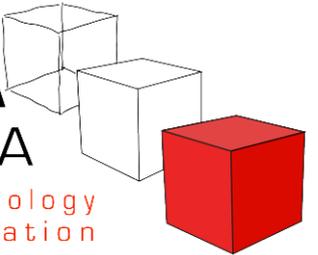




2019

DATTA  
VICTORIA  
Design And Technology  
Teachers Association 

NORTHERN COLLEGE OF THE ARTS & TECHNOLOGY – 6 DECEMBER

**Prytec**  
SOLUTIONS 

**TOOLS**  
for Schools  
TAFES & UNIVERSITIES  
Cultivating Craftsmanship



## Welcome

KeepnTrack on the Impact of Makerspaces on Student Learning –

*“Makerspaces foster three important principles: place, community and making things. It’s where students can develop skills like collaboration, idea creation and prototyping. Kids get the opportunity to discover, tinker, produce, solve, fail, design, invent and experiment. We are guiding the next generation of thinkers, creators, innovators and entrepreneurs. Why would we want them all to thin the same, produce the same results and force them into all the same answers!*

*Makerspaces allow students to fail, which is a lesson in of itself. But, makerspaces most importantly foster questions and give the students the opportunity to experience how and why a concept works.”*

DATTA Vic welcomes you to our annual **Makerspace** Conference at the Northern College of the Arts and Technology (NCAT). **Makerspace** will explore teaching applied STEM, creative problem-solving in the classroom and design-based learning, as well as celebrating the joy of making!

The program will provide an exciting opportunity for delegates to discover best practice in new technologies, fresh approaches to teaching and learning, inspiring classroom projects and community programs – all through a range of practical and seminar-style workshops.

We are glad that you can join us at this very special end-of-year event, where you can upskill, network and share ideas and issues with your colleagues from across the state and beyond.

## Conference Schedule

Registration, Tea and Coffee, Trade Exhibition	8.00am - 9.15am
Welcome from the DATTA Vic President	9.15am - 9.30am
Workshop Presentations – Sessions 1 and 2	9.30am - 11.30am
Morning Tea, Trade Exhibition	11.30am - 12.00pm
Workshop Presentations – Session 3	12.00pm - 1.00pm
Lunch, Trade Exhibition	1.00pm - 2.00pm
Workshop Presentations – Sessions 4 and 5	2.00pm - 4.00pm

# Conference Program

Wood, Metal and Plastics	Textiles	Electronics and Systems Engineering	All / STEAM	 Primary
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## REGISTRATION from 8.00am

SESSIONS 1 and 2: 9.30am - 11.30am

<b>WORKSHOP 1</b> A Unit of Work for Junior Product Design (Wood) by Michael Essex	<b>WORKSHOP 2</b> Laser Curriculum Ideas by Alflex Laser 	<b>WORKSHOP 3</b> Traditional and Modern Methods of Transferring Student Designs onto Fabrics by Madison Bishop 	<b>WORKSHOP 4</b> A Play-Based Introduction to the Micro:bit by Martin Levins 	<b>WORKSHOP 5</b> Junior School Electronics on a Shoestring Budget by Anthony Gasson	<b>WORKSHOP 6</b> Understanding Arduino Sensors by Aleks Petrovic	<b>WORKSHOP 7</b> A Game-Based, Screenless Robot for Teaching Computing Concepts by Mukesh Soni 	<b>WORKSHOP 8</b> Makerspace Drop-In 
						<b>WORKSHOP 9</b> Integration of STEM in the Victorian Curriculum by Dr Penny Hale and Robert Malouf	<b>WORKSHOP 10</b> Makerspace Drop-In 

## MORNING TEA 11.30am - 12.00pm

SESSION 3: 12.00pm - 1.00pm

<b>WORKSHOP 11</b> Skateboards 101 by Justin Elliot 	<b>WORKSHOP 12</b> Differentiation Teaching within the Technology Classroom for Students with Special Educational Needs by Paul Haydock	<b>WORKSHOP 13</b> Teaching for Tomorrow by Holger Dielenberg and Debby Maziarz	<b>WORKSHOP 14</b> Introducing LEGO Education SPIKE Prime Robotics by Libby Moore 	<b>WORKSHOP 15</b> Arduino Science Kits – Physics Lab by Pathik Shah	<b>WORKSHOP 16</b> STEM in a Box by Roland Gesthuizen 	<b>WORKSHOP 17</b> Drones and STEM – A Perfect Match by John Pearce 	<b>WORKSHOP 18</b> Design Thinking and the Capabilities Curriculum – Finding a Fit by Monica Bini 
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## LUNCH 1.00pm - 2.00pm

SESSIONS 4 and 5: 2.00pm - 4.00pm

<b>WORKSHOP 19</b> Introduction to 3D Designing Using SketchUp by Bobby Chattrath 	<b>WORKSHOP 20</b> Precious Plastics by Rohan Bevan and Peter Murphy 	<b>WORKSHOP 21</b> School-based Assessment in Product Design & Technology and Systems Engineering by Leanne Compton	<b>WORKSHOP 22</b> PD&T Unit 2: Collaborative Design through Community Partnerships by Sarah El-Hage	<b>WORKSHOP 23</b> Developing Effective Intentions to Reward Risk Taking in Systems by Colin Chapman	<b>WORKSHOP 24</b> Build an LED Electronic Dice run from a Micro-controller by Pat McMahon 	<b>WORKSHOP 25</b> IOT– The Internet of Things by Adriano Frijo	<b>WORKSHOP 26</b> Learning by Design - Maker Pedagogy and 3D Printing by Dr Carly Osborn 
	<b>WORKSHOP 27</b> Introduction to Metal Engineering By Dr Karen O'Reilly Briggs	<b>WORKSHOP 28</b> Weird but Effective Ways to Approach Digital Design by Carlin Grieve 	<b>WORKSHOP 29</b> STEM & Textiles: <i>Eat, Play &amp; Sleep</i> – the Small Container House Project by Judy Baxt				

# Workshop Abstracts

## **Workshop 1: A Unit of Work for Junior Product Design (Wood)** by Michael Essex

9.30am-11.30am (Sessions 1 and 2)

Subject Area: Wood, Metal and Plastics; Suitable for: Secondary, VCE/VET/VCAL

Join Michael Essex as he gives a step-by-step guide to a Years 7/8 phone stand project. You will explore the unit of work from design to production and evaluation, and get hands-on experience using basic hand tools that are suitable for the junior years.

*Michael started his working life as a furniture maker completing his apprenticeship in 1992, then making and designing furniture for a further ten years. After completing an Arts degree and Diploma of Education he moved to Auckland and taught a range of technology subjects from trade-based furniture units to electronics and more general materials technology. He returned to Australia, first teaching at Lalor North College and now at Hume Central Secondary College. After several years spent on the DATTA Vic committee as a general member, he took on the role of Vice-President in 2018.*

## **Workshop 2: Enhancing STEAM - Laser Curriculum Ideas for the Classroom** by Alfex Laser

9.30am-11.30am (Sessions 1 and 2)

Subject Area: Wood, Metal and Plastics/ALL; Suitable for: Primary, Secondary, VCE/VET/VCAL

This session will explain the benefits of using lasers in education and reveal several STEAM-focused curriculum ideas to implement in the classroom. Discover what a powerful tool a laser can be in engaging, inspiring and educating students.

*Alfex Laser has Australia's largest range of lasers for cutting, marking and engraving. They provide full laser training and graphic software training to ensure teachers are confident in creating designs suitable for the classroom.*

## **Workshop 3: Traditional and Modern Methods of Transferring Student Designs onto Fabrics** by Madison Bishop

9.30am-11.30am (Sessions 1 and 2)

Subject Area: Textiles; Suitable for: Primary, Secondary, VCE/VET/VCAL

This workshop merges traditional and modern textile printing techniques using a silk screen and a CNC vinyl cutter. In the hands-on session heat transfer vinyl and vinyl stencils for screen printing will be explored, and participants will receive resources and ideas for the application of these processes in the classroom. Participants will also create examples by digitally or manually designing an image or pattern to apply to a textiles project.

*Madison is the VCE Product Design & Technology and 7-10 Technology teacher at Toorak College. Madison is passionate about Design Thinking, embedding new and emerging technologies into the curriculum and encouraging students to explore resistant and non-resistant materials to solve real world problems.*

## **Workshop 4: A Play-Based Introduction to the Micro:bit** by Martin Levins

9.30am-11.30am (Sessions 1 and 2)

Subject Area: Electronics/Sys Eng; Suitable for: Primary, Secondary, VCE/VET/VCAL

Participants will be given a brief introduction on electronic circuitry and a programming interface, then encouraged to play with a variety of sensors and actuators to build a solution to a challenge. Martin will also demonstrate how these can be used in Years 5-8 to complement existing projects. **Participants should bring their own laptops.**

*Martin works with the Australian Curriculum, Assessment and Reporting Authority (ACARA). He was a pioneer of internet use in K-12 education in Australia – his small rural school was the first in Australia to be connected to the internet. He has helped a generation of teachers and students through the huge cultural changes of the technological revolution. Leveraging technical expertise and experience in leadership and as a primary, secondary and tertiary educator in Technology, Design, Science and Mathematics, he is currently working with 160 disadvantaged schools in Australia, assisting them with the implementation of the Australian Technologies Curriculum.*

## **Workshop 5: Junior School Electronics on a Shoestring Budget** by Anthony Gasson

9.30am-11.30am (Sessions 1 and 2)

Subject Area: Electronics/Sys Eng; Suitable for: Secondary, VCE/VET/VCAL

In this practical hands-on workshop, participants will be taken through the process of making a low-cost electronic circuit using the copper nails and scrap wood method. Participants will be able to choose to build either an astable multi-vibrator "Flip Flop" LED flashing lights, or an automatic LED night light. Aimed at teachers of Years 7-8 who want to introduce electronics in their schools with a very low funding commitment.

*Anthony is a technology teacher who is passionate about engaging students with hands-on practical activities. From Automotive and Metalworking, to Robotics and Systems Engineering, he has worked with students to improve their confidence while problem-solving and encouraged students to push their skills to the next level.*

# Workshop Abstracts

## **Workshop 6: Understanding Arduino Sensors** by Aleks Petrovic

9.30am-11.30am (Sessions 1 and 2)

Subject Area: ALL/STEAM; Suitable for: Secondary, VCE/VET/VCAL

Sensors are at the heart of many electronic devices; they can be used as an indicator to test a certain condition and trigger a response. A greater understanding of how sensors function can help inventors and innovators apply problem-solving skills and generate practical and achievable ideas. This workshop will take an in-depth look at sensors and simple LED circuits, and will also explore computational thinking.

*For the past eight years Aleks been an E-Learning Developer and Trainer at St Monica's College. He has provided skill support and training for all staff, and assisted teachers with developing solutions for the classroom to fuse technology with teaching and learning. He is the co-founder of the STEAM Hub at the College, a digital sandpit/makerspace where students spend their free time tinkering with coding, electronics, microcontrollers, single board computers and 3D printing, digital design and drones.*

## **Workshop 7: A Game-based, Screenless Robot for Teaching Programming Concepts to Young Students** by Mukesh Soni

9.30am-10.30am (Session 1)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

Can we teach programming concepts to young students without ever using a computer, tablet or mobile device? If you thought it to be impossible, then this is the workshop for you! Matatalab is a hands-on coding robot for students aged 4-9. It helps them develop cognitive abilities, imagination and coding skills through hands-on play. The concepts in programming and algorithm development are offered using physical 'instructional blocks', without requiring any digital devices or screens. Participants will work in small groups to experience the art of programming without using a computer.

*Mukesh looks after the courseware development and training of educators at Pakronics. He is a PhD researcher at the University of Melbourne and has been associated with technology education in university and schools for the past nine years. Mukesh brings over 15 years of industry experience in technology, research and development from his earlier work with multi-national companies like General Electric, Bosch and Tektronix.*

## **Workshop 8: Makerspace Drop-In**

9.30am-10.30am (Session 1)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

Join our conference supporters in the trade exhibition for a range of hands on maker activities designed to teach you new skills and keep you updated with the latest educational tools and technologies.

## **Workshop 9: Integration of STEM in the Victorian Curriculum** by Dr Penny Hale and Robert Maalouf

10.30am – 11.30am (Session 2)

Subject Area: SYS ENG/Electronics; STEM, Suitable for: Secondary, VCE/VET/VCAL

STEM has been highlighted as a priority area in schools, but it is difficult to integrate within the Maths, Science and Technology areas at the same time. This workshop will look at a strategy to use the Digital Technology and Design Technology Curriculum as a framework for an integrated STEM course. An example project will be shared based on coding and product design.

*Dr Penelope Hale is the Director of STEM Education at Wellington Secondary College. She has worked in education at high school, college and university and is currently working with Wellington Secondary College in STEM Education and Maker Space.*

## **Workshop 10: Makerspace Drop-In**

10.30am-11.30am (Session 2)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

For a description of this session, see **Workshop 8**.

## **Workshop 11: Skateboards 101** by Justin Elliott

12.00pm-1.00pm (Session 3)

Subject Area: Wood, Metal and Plastics; Suitable for: Primary, Secondary, VCE/VET/VCAL

Calling all skater boys and girls to a skateboard building workshop for beginners. Using the Roarokit vacuum bag method, you will learn how to design and create your own skateboard. This simple method of construction uses no electricity, no hazardous glues and no power tools.

*Justin has been teaching Design & Technology for the past 16 years and producing skateboards for the past seven years.*

# Workshop Abstracts

## **Workshop 12: Differentiation Teaching within the Technology Classroom for Students with Special Educational Needs**

by Paul Haydock

12.00pm-1.00pm (Session 3)

Subject Area: ALL; Suitable for: Secondary, VCE/VET/VCAL

The focus of this workshop is to provide classroom teachers with a better understanding of the basic needs for differentiation within the technology classroom and the types of learners that it has the greatest impact on. We will identify areas of differentiation both teacher and student can use when designing and developing a classroom project. Attendees will also look at sample lesson plans to discuss which have best accommodated for students learning needs and will also have time to work on their own lesson plans to incorporate differentiation into their planning.

*Paul is Head of Product Design & Technology at East Doncaster Secondary College with over 10 years of teaching experience. He has a passion and focus on working with students with learning needs who are often present within the Technology classroom, whilst creating curriculum to accommodate their individual needs. Paul enjoys observing the progression of a child with learning needs when undertaking a well-organised and inclusive curriculum which promotes personal growth and development.*

## **Workshop 13: Teaching for Tomorrow by Space Tank Studio**

12.00pm-1.00pm (Session 3)

Subject Area: STEM/All; Suitable for: Secondary, VCE/VET/VCAL

How can we build teaching capacity to drive the STEM curriculum? In this workshop you will be investigating the challenges and opportunities facing student education and the needs of rapidly changing industries. What teaching capabilities are lacking in STEM/D&T curriculum? How can we shift the mind set from specific skill-based learning to innovation and entrepreneurship? How can we get more girls into STEM/D&T? These are just some of the big questions that you will be tackling in this workshop with Debby Maziarz and with Holger Dielenberg from Space Tank Studio, one of the pioneers of the Maker movement in Melbourne.

*Holger Dielenberg is a multi-disciplinarian with professional experience in creative, digital and construction industries in Australia and Europe. He applied his thirty years working in 3D animation for film and TV, fine art, building traditional yachts and residential construction, to founding Space Tank Studio in 2013. Space Tank provides innovators, designers and product development start-ups with prototyping technology and business incubator pathways to help them achieve success. He engages with industry, local government, businesses and the world of makers to attempt to broaden the acceptance of Makerspaces and grow an ecosystem of connections to assist product development entrepreneurs.*

*Debby Maziarz is a business development specialist and mentor for entrepreneurs and education providers. She is experienced in working alongside start-up founders, executive teams, staff, boards, Councilors, volunteers and frontline workers in a range of contexts and environments. As a facilitator and public speaker, Debby has delivered her highly sought after, community governance-training program across local government departments in Victoria and New South Wales and is renowned for her fun, inspiring and authentic approach to skills development, sector sustainability and community capacity building.*

## **Workshop 14: Introducing LEGO Education SPIKE Prime Robotics by Libby Moore**

12.00pm-1.00pm (Session 3)

Subject Area: Electronics/Sys Eng; Suitable for: Primary, Secondary, VCE/VET/VCAL

Accelerate STEM learning in your classroom with SPIKE Prime and explore the full continuum from early years to middle years with LEGO Education robotics. From easy entry lessons to the limitless creativity design challenges that will engage your students to think critically, analyse data and solve complex problems with real-world relevance. The intuitive LEGO building system, intelligent hardware and coding will give your students the ability to develop the STEM skills of today, to be the innovators of tomorrow.

*Libby has taught in Victorian schools for 15 years. It was during this time that her passion for LEGO Education and the educational benefits to teachers and children of 'hands-on minds-on learning' began. Moore Educational has been an official partner of LEGO Education for over 20 years. Libby is also the director of LEGO Education Innovation Studios in Melbourne and Brisbane where a unique learning environment engages children and teachers in STEM, innovation and the development of skills for 21st Century learning.*

## **Workshop 15: Arduino Science Kits – Physics Lab by Pathik Shah**

12.00pm-1.00pm (Session 3)

Subject Area: Electronics/Sys Eng; Suitable for: Secondary, VCE/VET/VCAL

Developed in partnership with Google, the Arduino Science Kit Physics Lab is an Arduino-based physics lab, fully compatible with Google Science Journal available on Android. Have fun and learn at the Arduino Science Fairground! Experiment with forces, motion, magnetism and conductivity. Students will make their own hypothesis like real scientists, then check their assumptions, and log data thanks to Google's Science Journal – a digital notebook for conducting and documenting science experiments in real-time using the smart capabilities of mobile devices. No coding experience required! Enjoy this new series of plug and play projects.

*Pathik is an electronic engineer by trade and enjoys looking for the latest technologies that could be utilised in classrooms for Digital Technology. Pathik founded Pakronics, a unique, one-stop shop for educators where they can not only buy the product but also receive technical support, product information and crash-courses for a range of STEM tools. Pathik has been instrumental in hand-picking STEM products valued by educators of varying expertise and customizing kits to suit the unique needs of each classroom.*

# Workshop Abstracts

## **Workshop 16: STEM in a Box** by Roland Gesthuizen

12.00pm-1.00pm (Session 3)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

Curiosity, creativity, and problem-solving underpin the pedagogical content knowledge required for integrating STEM in teaching and learning. Monash University's Faculty of Education, as part of their Engaging STEM Strategy, are creating pop-up learning makerspaces for students and staff to experience as well as shipping out STEM kits to remote and rural schools. Preparing pre-service teachers to engage in STEM requires the design of hands-on learning challenges that nurture these competencies in an engaging and non-threatening manner, where learning is play.

*Roland is a STEM Method Lecturer at Monash University and Journal editor for DLTV. His teaching interests span Science, Digitech and STEM Education. Roland has grounded his teaching practice in his professional experience as a research scientist with ICI Australia (Orica). As an Internet pioneer, he was the first to help design and build an Australian public utility website and EarthDial used with the NASA Mars Rovers for the Planetary Society. Roland's work has been recognised with an ACCE Educator of the Year Award and ISTE Making IT Happen award. As a PhD candidate, his current research is exploring inspiration and the conative domain within STEM Education.*

## **Workshop 17: Drones and STEM – a Perfect Match** by John Pearce

12.00pm-1.00pm (Session 3)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

Everywhere you turn these days there are stories about drones and how they are going to change the way we live. The big question is how can schools leverage this interest? Programmable and other entry-level drones are now priced very keenly. Even higher-level machines are being used productively in education settings. From developing understandings of the physics of flight through to Maths and Engineering activities and more, drones have a lot to offer students from middle school and beyond. This session will explore some school-based drone options and how they might be utilised.

*Having spent more than thirty years teaching in primary schools, John Pearce now tutors at Deakin University. John's ongoing interest in the use of ICT across the curriculum has seen him present at local, National and international conferences. Lately he has become interested in the digital curriculum including coding and Makerspaces with an emphasis on the classroom implications around these themes.*

## **Workshop 18: Design Thinking and the Capabilities Curriculum – Finding a Fit** by Monica Bini

12.00pm-1.00pm (Session 3)

Subject Area: ALL/STEAM, Suitable for: Primary, Secondary, VCE/VET/VCAL

Participants will be provided with an overview of the Capabilities relevant to Design Thinking, including Critical and Creative Thinking, and Personal and Social Capability. They will then undertake facilitated activities to map Design Thinking to the Capabilities. Assessment and explicit teaching of the Capabilities will also be discussed. By the end of the session participants will have gained insight into how to strengthen implementation of Design Thinking in their school through building connections to the Capabilities.

*Monica Bini is the VCAA Capabilities Curriculum Manager. She was project manager for the development of the Victorian Curriculum: F-10 Critical and Creative Thinking and Ethical Capability and is currently working on implementation projects across all four Capabilities within the Victorian Curriculum: F-10. Monica has a tertiary background in informal and formal logic and critical thinking, as well as ethics and economics. Before joining the VCAA, Monica taught Philosophy, Business Studies and Humanities in secondary schools for over a decade.*

## **Workshop 19: Introduction to 3D Designing Using SketchUp** by Bobby Chattrath

2.00pm-4.00pm (Sessions 4 and 5)

Subject Area: Wood, Metal and Plastics; Suitable for: Primary, Secondary, VCE/VET/VCAL

Learn 3D designing in a day using SketchUp. This session will cover all the tools available in SketchUp and will also explain how to use SketchUp for 3D printing and Laser cutting.

*Bobby has been working as a Systems Engineering teacher at Nossal High School since 2012.*

## **Workshop 20: Precious Plastics** by Rohan Bevan and Peter Murphy

2.00pm-3.00pm (Session 4)

Subject Area: Wood, Metal and Plastics; Suitable for: Primary, Secondary, VCE/VET/VCAL

Precious Plastic is a global movement with the aim of eliminating plastic waste through low volume, high value recycling. This workshop will explore the journey of setting up a plastic recycling workspace as part of a VCAL program – from funding, community building, curriculum links, product design and marketing. We will also discuss ways in which STEM skills can be meaningfully embedded into this and other projects to help make science, technology, engineering and maths make sense to students, and raise the profile of a VCAL program.

# Workshop Abstracts

**Rohan** is a trained Industrial Designer, who worked with architects, sculptors, interior designers and engineers to create perfectly designed solutions. Now VCAL Co-ordinator and PD&T teacher at Northcote High School, his focus is on empowering students through project-based learning. Rohan sits on the DATTA Vic committee and maintains an interest in Digital Learning, making and research.

**Peter** is President of DATTA Australia. He trained as an industrial designer in the UK and is now a PD&T Teacher and Leading Teacher at Northcote High School. He has been part of PD&T VCE review panel and VCAA/ACARA expert panels reviewing the Australian Curriculum. Peter has published teacher support material for VCE Unit 1 PD&T, and is the creator of *So You Think You Can Design* and *National Design & Technologies Week*.

## **Workshop 21: School-based Assessment in Product Design & Technology and Systems Engineering**

by Leanne Compton

2.00pm – 3.00pm (Session 4)

Subject Area: ALL/STEAM; Suitable for: Secondary, VCE/VET/VCAL

This session will focus on school-based assessment for both VCE Product Design & Technologies and VCE Systems Engineering. It is designed to build skills and knowledge to enable increased teacher capacity to develop VCE assessment tasks that are compliant, engaging, rigorous and accessible. This session will also provide findings from the audit of school-based assessment for both these studies, to further support teachers' understandings of school-based assessment and the VCAA VCE assessment principles.

*Leanne Compton is the Curriculum Manager of Design and Technologies at the VCAA. She has responsibility for a range of studies including Product Design & Technologies and Systems Engineering.*

## **Workshop 22: PD&T Unit 2 – Collaborative Design through Community Partnerships** by Sarah El-Hage

2.00pm – 3.00pm (Session 4)

Subject Area: Textiles; Suitable for: Primary, Secondary, VCE/VET/VCAL

To encourage students to think and work like a 'real designer', find a group in the community that really needs their help! It's a great way to create a positive relationship between students and the greater community. Sarah's Year 11 Product Design & Technology Textiles class designed and made 'night ware' for 13 women at an aged care facility in Warrnambool. It was a rewarding experience for both parties and really taught the students what it's like to be a fashion designer.

*Sarah is a Design & Technologies Teacher (Materials & Textiles) at Emmanuel College Warrnambool. She was trained at the University of Melbourne in visual arts and majored in metalwork. Sarah has taught in a variety of Catholic Schools in Melbourne and Warrnambool.*

## **Workshop 23: Developing Effective, Feasible and Challenging Intentions to Motivate and Reward Risk-taking in Systems Engineering** by Colin Chapman

2.00pm-4.00pm (Sessions 4 and 5)

Subject Area: Electronics/Sys Eng; Suitable for: Secondary, VCE/VET/VCAL

Developing effective, feasible and challenging intentions has been a cornerstone of the Systems Engineering Study Design. It allows learners to take risks in their learning by establishing a baseline from which achievement may be assessed. Design process are necessarily iterative and multifactorial, where intentions may not unfold as planned. This workshop will explore the role of modelling as a tool for developing intentions and rewarding learners when intentions do not match outcomes in the design process. These processes are suitable for all Secondary education.

*Colin Chapman was trained in Physics and has a keen interest in Physics, Mathematics, robotics, engineering, sport and sewing. He has taught Mathematics, Physics, Systems Engineering and Chemistry in both the International Baccalaureate Diploma Programme and VCE. After spending four years developing and teaching programmes in Switzerland where he won a Google RISE Award as the curricula and pedagogical leader of Grlbotics. He returned to Australia to teach and is currently the State Reviewer of Systems Engineering for the VCAA.*

## **Workshop 24: Build an LED Electronic Dice run from a Microcontroller** by Pat McMahon

2.00pm-4.00pm (Sessions 4 and 5)

Subject Area: Electronics/Sys Eng; Suitable for: Primary, Secondary, VCE/VET/VCAL

In this hands-on session suitable for all abilities, participants will build and take away an LED electronic Dice and a microcontroller. The Dice will run randomly from the touch of the push button switch.

*In the last 15 years, Pat has had over 3,000 students build a Picaxe microcontroller and control some great award-winning models. He has run workshops for over 900 Teachers. Pat has been fortunate to have shown his students' work overseas and has received eight Awards, at Regional, State, National and International levels, for innovation and excellence. In 2017, Pat was awarded an Honorary Membership of DATTA Vic in recognition of his major contribution to Design & Technologies education.*

# Workshop Abstracts

## **Workshop 25: IOT– The Internet of Things** by Adriano Frijo

2.00pm-4.00pm (Sessions 4 and 5)

Subject Area: ALL/STEAM, Suitable for: Secondary, VCE/VET/VCAL

The internet of things (IoT) is changing the way we live and behave. In this workshop, we will explore where IoT is currently being used in the world and will build knowledge and understanding about where IoT could be integrated into Artificial Intelligence in the future. Running an informational workshop including a demonstration of IoT in action, attendees will have the opportunity to make a motion detection system which sends out an SMS upon detection. **Participants should bring their own laptops with [RaspberryPi software downloaded](#).**

*Adriano Frijo is a Design & Technologies teacher at St Monica's College.*

## **Workshop 26: Learning by Design – Maker Pedagogy and 3D Printing** by Dr Carly Osborn

2.00pm-4.00pm (Sessions 4 and 5)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

3D design and printing have terrific teaching potential beyond the simple production of objects. Discover how Design Thinking processes can elevate your teaching across the curriculum, and gain confidence and strategies for implementing design-based pedagogies in the classroom. Learn how to use 3D printing and design as an effective, everyday teaching tool. The Makers Empire program is suitable for students from 4 years old.

*Dr Carly Osborn is a former classroom teacher, now teacher professional development expert. She is passionate about rich, engaging teaching and learning that helps our kids become confident creators and change makers.*

## **Workshop 27: Introduction to Metal Engineering** by Dr Karen O'Reilly Briggs

3.00pm-4.00pm (Session 5)

Subject Area: Wood, Metal and Plastics; Suitable for: Secondary, VCE/VET/VCAL

Join Karen and trade qualified pre-service teachers from La Trobe Uni as they put the E into STEM in this hands-on session which offers a step-by-step introduction to metal engineering. Participants will discover how to work with metal, and watch skilled tradespeople operate machinery such as welding machines and lathes. Participants will create a metal object to take home. **Participants must bring work boots, cotton drill overalls, safety glasses and riggers/leather gloves. No flammable materials, loose clothing or loose hair.**

*Before working as an academic at La Trobe University, Karen worked in manufacturing and engineering as a qualified boilermaker/metal fabricator, pressure vessel welder, pipefitter, welding inspector and VET teacher. In 2012, she was awarded La Trobe University's David Myers Scholarship to pursue full time research in the field of engineering trade vocational education and graduated in 2016 as a PhD. Karen currently coordinates the Bachelor of Technology Education program at La Trobe University, and lectures and researches in Technology and VET, advanced manufacturing, engineering trades, and skill and capability requirements for jobs of the future.*

## **Workshop 28: Weird but Effective Ways to Approach Digital Design** by Carlin Grieve

3.00pm-4.00pm (Session 5)

Subject Area: ALL/STEAM; Suitable for: Primary, Secondary, VCE/VET/VCAL

Exploring several tools and resources to design for 3D and visualise 3D designs, from Tinkercad, to Fusion 360. We will also go into some weird virtual reality tools such as Tilt Brush and looking at a range of ways to view designs, from volumetric displays to 3D printing, as well as considering the pros and cons of each method. If you are new to the digital world or an experienced veteran, this presentation caters to you.

*Carlin has worked as a teacher for over 9 years and is currently the Learning Technologist for the Whittlesea and Banyule Nillumbik Tech Schools. With a work background in Information Technology and small engine mechanic, this has provided Carlin with the expertise required for the Digital and Design & Technologies.*

## **Workshop 29: STEM & Textiles – Eat, Play & Sleep: The Small Container House Project** by Judy Baxt

3.00pm-4.00pm (Session 5)

Subject Area: Textiles; Suitable for: Secondary, VCE/VET/VCAL

Shipping container houses are becoming increasingly popular around the world. In this session, we discuss student design folio work, floorplans, model making, textile products for the structure and camping recipes to be cooked in a small house. This project can be used for Years 7-10 D&T/Textiles or a VCE Product.

*Judy Baxt is a Technology, Textiles and Food Studies teacher at Bayside College in Altona North.*

# Conference Information

Register for the Conference **HERE**

## About NCAT

The *Maker Space 2019* Conference is being held at NCAT – 62 Murray Road, Preston VIC 3072. Phone 03 9478 1333 or visit [www.ncat.vic.edu.au](http://www.ncat.vic.edu.au)



The Northern College of Arts and Technology caters for Year 10, VCE, VCAL and post-secondary students seeking a specialised education in the performing arts, visual arts, design, media, trades or technologies.

Industry professionals deliver innovative curriculum designs to meet current Tertiary, TAFE and industry requirements. With one of Victoria's broadest VET offerings, state-of-the-art facilities and a highly successful track record, the College provides a mature study environment to foster individuality and personal growth.

As a College, they recognise multiple types of intelligence. They reward practical problem solving, creativity, lateral thinking, building, fixing, designing and innovating. Every student benefits from a curriculum designed to encourage individuality and creativity. Their hands-on learning approach develops confidence, teamwork and co-operation skills for students who wish to pursue further study, apprenticeships or employment.

DATTA Vic wish to thank Raffaella Galati-Brown, Daniel Knott, Peter Doukas, Tom La and all the staff at NCAT for their help in planning and running the *Makerspace 2019* conference.

## Accommodation

**BellCity** Hotels, Residences, & Events

*Mantra Bell City* are offering our delegates a 10% discount on any accommodation booked for the conference. Just mention DATTA Vic at the time of booking. Phone 03 9485 1000, email [bellcity.res@mantra.com.au](mailto:bellcity.res@mantra.com.au) or visit [www.bellcity.com.au/hotel/mantra-bell-city/](http://www.bellcity.com.au/hotel/mantra-bell-city/)

## Parking & Transport

There is parking available on-site at NCAT and additional spaces available in the surrounding streets. For public transport options visit [www.ptv.vic.gov.au](http://www.ptv.vic.gov.au)

## Workshop Sessions

Some workshops have limited numbers so book early to ensure you get first choice. Also, please make sure you note which workshops require you to bring your own materials or devices.

## Presenters

A huge thank you goes to all of our conference presenters, for giving up their time and for sharing their skills and knowledge. We are so grateful for your contribution!

## Trade Exhibitors

All trade exhibitors are located in **T13** along with the catering, allowing delegates to peruse a range of resources, materials and equipment at their leisure throughout the day. A list of delegates is given to our trade exhibitors so they can send you details of special member offers – should you wish your name removed from this list, please contact Laura at [pl@datta.vic.edu.au](mailto:pl@datta.vic.edu.au).

## Photography

Our conferences are photographed, and the images are used in DATTA Vic publications, mail outs, on social media and on our website. Should you wish your image not to be published, please contact Charli at [events@datta.vic.edu.au](mailto:events@datta.vic.edu.au).

## Pricing

DATTA Vic Member: \$250

Non-Member: \$400\*

Student/CRT: \$100\*

*\*includes DATTA Vic membership for 2020*

**Group discounts for school members** - two attendees will receive a 5% discount, and groups of three or more attendees will receive a 10% discount.

## Cancellations

DATTA Vic will refund the full fee, less an administration cost, if you cancel before 22 November and 50% of the fee if you cancel before 29 November. If you register but do not attend without cancelling prior to an event you will be charged the full fee unless a medical certificate is provided.

## Disclaimer

DATTA Vic will not accept liability for damage or loss of any nature sustained by participants, suppliers, agents, contractors, consultants or their accompanying persons, to their personal property as a result of the DATTA Vic Makerspace conference, Trade Show or any related events. This program is correct at the time of printing and subject to change without notice. Please accept our apologies for any inconvenience caused. Notice of cancelled sessions will be circulated to registered delegates as soon as practical.

## Enquiries

Contact Laura at [pl@datta.vic.edu.au](mailto:pl@datta.vic.edu.au) or 03 9349 5809 if you have any questions about the DATTA Vic *Makerspace 2019* conference. For all invoicing enquiries, contact Hannah on [admin@datta.vic.edu.au](mailto:admin@datta.vic.edu.au) or 03 9349 1538.



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