It Takes a Spark!
EDU Conference

Mount Alvernia College - 9 August 2019

KEYNOTES	CURRICULUM LINKS
The keynotes are both highly respected experts and Superstars of STEM in their respective fields. They will share their journey to achieve their roles and demonstrate practically Science as a Human Endeavour whilst inspiring the listeners.	
AMY HEFFERNAN Field Application Specialist at SCIEX Research Fellow at UQ Superstar of STEM	Science as a Human Endeavour • Scientific understandings, discoveries and inventions are used to inform personal and community decisions and to solve problems that directly affect people's lives (Level 5/6) • Scientific knowledge and understanding of the world changes as new evidence becomes available; science knowledge can develop through collaboration • and connecting ideas across the disciplines and practice of science (Level 7/8) • Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations (Level 7/8)
DR TALITHA BEST Associate Professor at Central Queensland University	

TEACHER MINI-MASTER CLASSES	CURRICULUM LINKS
The Teacher Mini-MasterClasses are designed to develop teacher capacity around some aspect of the planning of and the teaching of Science, Maths, HASS and/or Technology disciplines. There will opportunities for teachers to discuss with experts in their fields and/or with colleagues the pedagogy and approaches that work.	
Learning Algebra through Gamification Yuji Takahashi, Math Mate	Focus on the pedagogy of gamification to develop maths fluency and maths knowledge – specifically in algebra Mathematics: Patterns and Algebra Level 7 - 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Drones in STEM Education Damien Aldridge and Natalie Anderson, STEM Punks	Focus on the use of Drones as part of addressing elements of the Technologies Curriculum. STEM Punks, who deliver STEM PD throughout Australia, will identify the real life examples of its use in Science, Geography, etc • Science Inquiry Skills 4 – 9, Science Understanding (all areas) 4- 10 • Geography Inquiry Skills 4 – 10, Geography Understanding (all areas) 4- 10 • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 5 – 10 • Design and Technologies Curriculum: Engineering Principles, Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4, 7.4
Experimentary Dr Robert Bell	Focus on a collaboration tool and experiments that tie in with the Australian curriculum, covering topics such as Physics and Forces, Earth and Space, Living Things, Engineering and Technology, and the Chemical World. Science Inquiry Skills F – 9, Science Understanding (all areas) F- 9 AITSL Teacher Stds 2.1, 2.3, 2.6, 3.3, 3.4, 7.4
CS Unplugged in the Classroom Brisbane Robogals	Focus on technology free activities and pedagogy that will develop students in aspects of the Digital Technologies Curriculum. • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.6, 3.3, 3.4

Using Programmable Building Kits to develop thinkers and problem solvers Vincent Lin, UBTECH	Focus on the use of progammable building kits as part of addressing elements of the Technologies Curriculum. UBTECH are a global Robotics and AI company and will identify the real life examples of its use in Science, Geography, Engineering, etc • Science Inquiry Skills 4 – 9, Science Understanding (all areas) 4- 10 • Geography Inquiry Skills 4 – 10, Geography Understanding (all areas) 4- 10 • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 5 – 10 • Design and Technologies Curriculum: Engineering Principles, Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4, 7.4

DIGI-DESIGN MINI-WORKSHOPS	**CURRICULUM LINKS**
The Digidesign MiniWorkshops are designed to be demonstate practically activities that will engage, inspire and develop students to be problem solvers, critical and creative thinkers, and so on using STEM as a vehicle. The workshops are also opportunities for students AND teachers to work together on activities. There will opportunities for teachers to discuss with experts in their fields and/or with colleagues the pedagogy and approaches that work. Feel free to ask the presenters for copies of their lessons plans, activities, etc.	
Future City Makers - 3D Design, Virtual Reality & Augmented Reality Damien Aldridge and Natalie Anderson, STEM Punks	Focus on the use VR and AR in 3D design as part of addressing elements of the Technologies Curriculum. • Geography Inquiry Skills 4 – 10, Science Understanding (all areas) 4- 10 • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 5 – 10 • Design and Technologies Curriculum: Engineering Principles, Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
An Introduction to Aboriginal Astronomy Dr Michael Cowley, USQ / Macquarie Uni	Focus on the Indigenous cross-curriculum priority in the area of Science. Excellent engaging session that received great reviews at the Toowoomba Conference. • Science Inquiry Skills 4 – 10, Science Understanding (all areas) 4 - 10 AITSL Teacher Stds 2.1, 2.3, 2.6, 3.3, 3.4, 7.4
Capture the Flag Teena Matai and Elise Taylor, Kilcoy State High School	Focus on the simple design challenge that is hihgly engaging whilst developing deep understanding of Science and Engineering • Aspects of Critical and Creative Thinking • Science Understanding: Levels 4 - 8 • Design and Technologies Curriculum: Engineering Principles, Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
What's in the Box? Year 9/10 Digital Technology Students, Mt Alvernia College	Focus on the how students can co-design and co-lead learning using elements of the Technologies Curriculum • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 7 – 10 • Design and Technologies Curriculum: Creating Designed Solutions Level 7 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Experimentary Dr Robert Bell, Experimentary	Focus on a collaboration tool and experiments that tie in with the Australian curriculum, covering topics such as Physics and Forces, Earth and Space, Living Things, Engineering and Technology, and the Chemical World. • Science Inquiry Skills F – 9, Science Understanding (all areas) F- 9 AITSL Teacher Stds 2.1, 2.3, 2.6, 3.3, 3.4, 7.4

Introduction to EV3 Mindstorm Robotics Simon Richardson & Justin Pembroke Chancellor State College	Focus on the having students and teachers code and operate a popular robotics platform whilst learning about computational thinking • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Creating Digital Solutions Level 7 – 10 • Design and Technologies Curriculum: Creating Designed Solutions Level 7 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
More than Bits and Bytes – Binary Unplugged Reid Moule and Students, HumpyBong SS	Focus on the how to teach and learn Binary – a critical aspect of the Dgiital Technologies Curriculum. All teachers will leave with a structured unit plan and resources • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 4 – 8 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Exploring Robotics and Engineering Wilson Kong, Robotics Playground	Exploration of the pedagogy of learning through playing by approaching robotics and engineering in a fun and engaging way • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 4 – 8 • Design and Technologies Curriculum: Creating Designed Solutions Level 4 – 8 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Snap Rovers - Circuits to Motion! Georgia Nicholson and Dominique MacDonald, Griffith University Women in Engineering Part 1 of 3 similar workshops aimed at different levels	**Beginning:** Primary focused electronics workshop which demonstrates the use of electronics and forces / motion • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 4 – 6 • Design and Technologies Curriculum: Creating Designed Solutions Level 4 – 6 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Scratch and Micro:bits Year 8 Students, Mt Alvernia College Part 2 of 3 similar workshops aimed at different levels	**Developing:** Links visual programming with electronics • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 4 – 8 • Design and Technologies Curriculum: Creating Designed Solutions Level 4 – 8 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Controlling Circuits with Arduinos Brisbane Robogals Part 3 of 3 similar workshops aimed at different levels	**Extending:** This brings together electronics and coding and lays the basis for more extensive projects in General Science, Environmental Science and Design • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 6 – 10 • Design and Technologies Curriculum: Creating Designed Solutions Level 7 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Internet of Things Shane Krog and Gatton SS Students	Focus on the digital systems by Shane Krog and his students from Gatton SS. This session received great reviews at the Toowoomba Conference and both teachers and students were engaged and asked lots of questions. • Aspects of Personal and Social Capability, Critical and Creative Thinking • Digital Technologies Curriculum : Digital Systems, Data and Information, Creating Digital Solutions Level 7 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
STEAM Circus Dr Meg Hooper, Vanessa Thomas, Matilda Hendrie, STEAM Circus	Focus on acrobatics skills and STEAM. Luke Wild from Ipswich Junior Grammar will be the Educator partnering with the STEAM circus to explain the principles of Science, etc involved • Aspects of Personal and Social Capability, Critical and Creative Thinking

	• Science Inquiry Skills F – 9, Science Understanding (all areas) F- 9 • Design and Technologies Curriculum: Creating Designed Solutions Level 7 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Young Changemakers Jeanette Hodgson and Rie Kocho, ChangeMakeHer	**Developing:** Focus on a rapid innovation challenge and empowering students to develop instrinsic motiovation and drive their own learning. This workshop is led by students from Brisbane SHS. • Aspects of Personal and Social Capability, Critical and Creative Thinking, Ethical Understanding • Sustainability cross-curriculum priority • Science Understandings: Levels 4 – 8 • Design and Technologies Curriculum: Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
Sustainability MiniHack Experience - Entrepreneurial Problem Solving for the Planet Peta Ellis, River City Labs	**Extending:** led by Peta Ellis who founded River City Labs which mentors and supports Brisbane Startups and entrepreneurs. This is a more entrepreneurial version of causing change in the world. • Aspects of Personal and Social Capability, Critical and Creative Thinking, Ethical Understanding • Sustainability cross-curriculum priority • Science Understandings: Levels 4 – 10 • Design and Technologies Curriculum: Creating Designed Solutions Level 5 – 10 AITSL Teacher Stds 1.5, 2.1, 2.3, 2.5, 2.6, 3.3, 3.4
STEAM Expo • Shane Krog and Gatton SS • Mt Alvernia – Minidrones • UQ Women in Engineering • Wonder of Science • Robotics Playground • Micromelon Robotics • STEM Punks • MathMate • Officemax • Modern Teaching Aids • Engineers Australia • STAQ / QAMT	The STEAM Expo is designed to showcase a range of short hand-on activities that can be run in schools. The activities can address various aspects of : ○ Digital Technologies Curriculum : Creating Digital Solutions Level 5 – 10 ○ Design and Technologies Curriculum: Creating Designed Solutions Level 5 - 10 ○ Science Understandings Level 4 – 10, ○ Sustainability cross-curriculum priority ○ Maths curriculum • There is also an opoortunity for teachers and students to discuss Science, Engineering, Robotics, Programming, Mathematics with experts in their field. They can discuss HOW to enact STEAM learning in their classes and the pedagogy that could be used. • Whilst some of the Expo presenters will demonstrate particular products we have specifically asked them to showcase the HOW as core to them being part of the Expo. AITSL Teacher Stds 2.1, 2.3, 2.6, 3.3, 3.4, 3.6, 7.4

PROBLEM SOLVERS	CURRICULUM LINKS
Solving an Age Old Problem Dr Adrian Bertolini	Each Problem Solver demonstrates the design process (called Creating Designed Solutions in the curriculum): invesigating, generating, producing, evaluating, planning and managing. The aim is to model the process for teachers and students so they can see HOW they can use real-life design challenges to develop: • Also addresses aspects of the general capabilities – critical and creative thinking,personal and social capability, ethical capability, and intercultural capability • Various aspects of Science Understandings Level 4 – 10, Geography Understandings Level 4 – 10 Level 4-10 • Digital Technologies Curriculum : Creating Digital Solutions Level 5 – 10 • Sustainability cross-curriculum priority • Note: the design process is also applicable to other disciplines such as HASS, English, Maths, etc • AITSL Teacher Stds 2.1, 2.3, 2.6, 3.3, 3.4, 3.6, 5.2, 5.4, 7.4
Why Waste Water? University of Queensland	
Coding for Disaster Relief Engineers without Borders	
Sustainable Bridges Engineers without Borders	
Clean Water Engineers without Borders	
Destruction of Australia's Basic Needs Claudia Lezar, QUT	
SolarBuddy Social Innovation Challenge Johnathan Lamb, Solar Buddy	