

PRESENTING THE 8TH ANNUAL

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STEM Education Conference

18-19 October 2021 | Virtually Delivered

OCT

Day 1 | Monday 18th October

All times are in Australian Eastern Daylight Time (AEDT)

08:50 OPENING | Opening remarks from the Chair

Ian Fairhurst, *Team Leader of ICT Integration K-6, Knox Grammar Preparatory School (NSW)*

NEXT GENERATION STEM EDUCATION

09:00 Quality teaching matters for the future of STEM

- The strength of STEM is fundamentally connected with the quality of school education
- Switching students on to STEM and building aspirations for STEM career and higher education pathways, requires attention to pedagogy, curriculum and culture
- Using evidence from multiple large studies conducted across the primary and secondary years, this talk highlights the many ways in which quality teaching matters and what teachers can do to enrich STEM classrooms

Laureate Professor Jenny Gore, *Director, Teachers & Teaching Research Centre, School of Education, University of Newcastle (NSW)*

09:30 PANEL | How should we measure 'success' in STEM education?

- Should we measure 'success' in terms of: engagement and enrolment in STEM subjects and programs, academic performance in STEM subjects, interest and pursuit of STEM careers after school, or other areas?
- What is the right balance and how do we achieve it?
- What areas of STEM education have schools experienced a plateau in and what has been done to address this?
- What are some examples of schools, industry partners, government and the community working well to achieve this?

Panellists

Daniel Dawkins, *Head Teacher TAS, West Wallsend High School (NSW)*

Laureate Professor Jenny Gore, *Director, Teachers & Teaching Research Centre, School of Education, University of Newcastle (NSW)*

Jacqueline Gough, *Head of Curious Minds, Haileybury (VIC)*

Wendy Bode, *Deputy Principal of Global Tropics Futures, Thuringowa State High School (QLD)*

Moderator: Dr Scott Sleep, *STEM Project Advisor 7 - 12, NSW Department of Education, Educational Standards Directorate (NSW)*

10:20 MINISTERIAL ADDRESS

Please note this is a pre-recorded session.

The Hon Sarah Mitchell MLC, *Minister for Education and Early Childhood Learning (NSW)*

10:35 Refreshment break

IMPLEMENTING SUCCESS

11:05 **CASE STUDY** | Increasing academic rigor and student performance in STEM

- How we transformed our approach to STEM, leading to increased engagement in senior subjects and raising achievement and academic excellence
- Girls education and increased engagement
- The impact of meaningful STEM Education pathways and how our alumni are pursuing successful careers in engineering and science fields

Daniel Dawkins, *Head Teacher TAS*, **West Wallsend High School (NSW)**

11:35 **HANDS ON** | The sky is no longer the limit: Frameworks for deep learning and effective models of technology integration

- Leveraging student agency for deeper learning
- Developing a student-centred competencies-based continuum of learning
- Students as co-constructors and co-regulators of STEM learning environments

Ian Fairhurst, *Team Leader of ICT Integration K-6*, **Knox Grammar Preparatory School (NSW)**

Angus Fabian, *Technology Facilitator*, **Knox Grammar Preparatory School (NSW)**

Sue Floro, *Head of Prep*, **Knox Grammar Preparatory School (NSW)**

12:35 **Lunch break**

EMPOWERING INDIGENOUS STUDENTS

13:35 **Young Indigenous Women's STEM Academy**

- Building confidence in young Indigenous women through the Academy and how schools can get involved
- Connecting students with Aboriginal and Torres Strait Islander leaders in STEM learning
- How teachers can build their own confidence in talking about Indigenous knowledge

Myra Singh, *Academic Coordinator*, **CSIRO (NSW)**

CONNECTING WITH COMMUNITY

14:05 **CASE STUDY** | "Science is my favourite subject!"

- Using sustainability to inform STEM teaching and inspire students
- Co-constructing science investigations to teach scientific method and science as a human endeavour
- Engaging your local community for resources and expertise

Katheryn Elliot, *Science and Environment Teacher*, **Farrer Primary School (ACT)**

Carol Quashie-Williams, *Assistant Director*, **Department of Agriculture, Water and the Environment (ACT)**

14:35 **CASE STUDY** | Post-Earth Pioneers: A stage 4 integrated project

- Challenges and successes of running a cross-KLA STEM project
- Timetabling and staffing an integrated project
- Tips for connecting with industry and community

Nicola Steele, *Leader of Integrated Learning*, **St Clare's College, Waverley (NSW)**

15:05 **Refreshment break**

15:35 CASE STUDY | Engaging girls in STEM through project-based learning & visible thinking

- How visible thinking routines were used to engage primary school students in a web-design project
- Learn how to apply a design process to support students in planning, creating and reviewing their STEM work
- Take away ideas and strategies to help you manage your own STEM projects

Matthew Scadding, *ICT Integrator*, **Ravenswood School for Girls (NSW)**

16:05 CASE STUDY | How to put the A in STEM

- Ideas for utilising an agriculture, food and fibre perspective in the classroom
- Primezone and PIEFA programs
- Case Study of Barker College

Luciano Mesiti, *CEO*, **Primary Industries Education Foundation Australia (PIEFA) (NSW)**

16:35 CLOSING | Closing remarks from the Chair

Ian Fairhurst, *Team Leader of ICT Integration K-6*, **Knox Grammar Preparatory School (NSW)**

16:45 END OF DAY ONE



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Day 2 | Tuesday 19th October

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08:50 **OPENING** | **Opening remarks from the Chair**
Teresa Janowski, *Founder and CEO, STEM Fast Track (SA)*

INSIDE INDUSTRY

09:00 **STEM Industry School Partnerships (SISP) Program, education and industry collaborating to make NSW a trillion-dollar economy**

This session will explore how NSW is growing world-leading industries and develop a workforce to establish Australia as a global centre of excellence in innovation. Learn about what industries will drive growth in the future and how the NSW Department of Education's STEM Industry School Partnerships (SISP) program is partnering with Industry and Government to drive interest in STEM professions.

- How SISP program initiatives assist teachers to engage students with industry through STEM
- What are the world-leading industries that will drive economic activity in Australia and NSW?
- How are government, industry and education collaborating to engage young people in STEM?
- How to use an integrated STEM curriculum to foster interest in STEM careers and drive growth in STEM professions

Dr Scott Sleaf, *STEM Project Advisor 7 - 12, NSW Department of Education, Educational Standards Directorate (NSW)*

09:30 **CASE STUDY** | **School-Industry partnerships for impact**

When successful partnerships are built between schools and industry, three things happen:

- Student learning becomes linked to real world problems, resulting in increased student engagement
 - Teachers become more confident and capable in teaching integrated STEM programs
 - Industry partners learn alongside schools about how to support Gen Alpha, the 2030 workforce
- Paul will discuss how surveyors and surf lifesavers are helping the teachers they support at She Maps achieve these three points, and what you need to consider to build a successful school-industry partnership.

Paul Mead, *Co-Founder & MD, She Maps (QLD)*

EMBEDDING ABORIGINAL AND TORRES STRAIT ISLANDER KNOWLEDGE

10:00 **CASE STUDY** | **The Macquarie-Yaegl Partnership: Enhancing STEM educational opportunities**

In this presentation, Joanne will provide an overview of the STEM educational opportunities that have arisen through a long-term respectful collaboration between Macquarie University and Yaegl and Bundjalung Elders. She will also provide advice and access to resources for teachers both new to incorporating Indigenous knowledge and perspectives into curriculum, and those with some experience in doing so, to give them the confidence to provide a wonderfully culturally rich STEM learning experience for their students and a rewarding experience for themselves.

Associate Professor Joanne Jamie, *Co-Director, National Indigenous Science Education Program, Macquarie University* and *Superstar of STEM, Science and Technology Australia (NSW)*

Deb Breckenridge, *Yaegl Cultural Liaison Officer, Indigenous Bioresources Research Group, Macquarie University* and *Learning Support Officer, Maclean High School (NSW)*

10:30 Refreshment break

CHANGE AND LEADERSHIP

11:00 **CASE STUDY** | **“Creationeering”: A fusion of Art and Engineering**

- The merging of Engineering, Science, Art and Technology
- Implementing augmented reality and its successes and challenges
- Exploring the project Lighting it up – Lamp Designs

Joanne Saville, *Curriculum Leader Creative Arts, Director of The Gen Art Academie, Genazzano FCJ College (VIC)*

11:30 **KEYNOTE** | **Address from the Department**

Georgina Harrisson, *Secretary, NSW Department of Education (NSW)*

12:00 **CASE STUDY** | **STEM engagement through outreach events and activities**

- How the success of our STEM Girls Day Camp model, provided to local primary school students, has impacted on STEM engagement
- Using industry networks and contacts to engage students not traditionally choosing STEM pathways
- Importance of engaging parents from an early stage in STEM education

Debbie Yates, *Head of ICT and STEM Program Coordinator, Ashdale Secondary College (WA)*

Stephen Warwick, *STEM Coordinator and D&T Teacher, Ashdale Secondary College (WA)*

12:30 Lunch break

DIGITAL TECHNOLOGIES

13:30 **STEM Connections Foundation to Year 8**

ACARA's STEM Connections project investigated a transdisciplinary approach to the teaching of STEM. ACARA has continued to apply and develop the principles of this project through the Digital Technologies in Focus project. This presentation will:

- Identify opportunities for addressing the dimensions of STEM
- Outline new STEM Connections Illustrations of practice from Foundation to Year 8
- Explore opportunities to enhance Digital Technologies implementation.

Julie King, *Senior Manager, Curriculum and Project Lead, Digital Technologies, ACARA (NSW)*

14:00 CASE STUDY | VR and AR in digital technologies: From consumers to creators

Digital Technologies facilitates authentic learning opportunities fostering confidence, curiosity, persistence, innovation, creativity, respect and cooperation. Virtual Reality and Augmented Reality provide opportunities to take students anywhere, thus widening their experiences and building background knowledge. Integrating this technology into the curriculum allows for the development of deeper understanding and enriching capabilities such as Literacy, Critical and Creative Thinking, Digital Literacy and Intercultural Understanding. Research tells us creativity in learning produces positive critical outcomes for students. In this workshop, participants will:

- Build their capacity in embedding digital technology across the curriculum
- Use VR/AR to realise its full potential in engaging students in real and imaginative worlds and see how it is a tool to enable science discovery and through the process of scientific inquiry
- Create solutions to move students and teachers from consumers of technology to creators through all Key Learning Areas

Jeannine Ucereli, *Assistant Principal - Learning and Teaching*, **St Joseph's Primary School, Port Macquarie, Diocese of Lismore (NSW)**

Sarah Blundell, *Leader of Digital Pedagogies/STEM*, **St Joseph's Primary School, Port Macquarie, Diocese of Lismore (NSW)**

14:30 SHOWCASE | The mighty power of the microcomputer: Inquiry learning through the use of micro:bits

- A framework for introducing baseline computing technologies at an age-appropriate and highly engaging level
- Students will guide participants through an exciting range of micro:bit classroom projects from Stage 1 through to Stage 3
- Mapping skill progressions - scaffolding inquiry learning projects and reducing the cognitive load to develop deeper student mastery over time
- Introducing a skillset, toolset and mindset for students to build STEM competencies
- Resources for implementing micro:bits in an inquiry classroom

Matt Hawke, *Stage 3 Educator and Year 6 Well-Being Leader*, **Knox Grammar Preparatory School (NSW)**

15:00 SHOWCASE | Immersive worlds: Inquiry learning through the use of AR, VR and XR

- Explore examples of creation within VR / AR current platforms and the experience the future of extended reality as a way of engaging the school community at all levels
- Students will guide participants through a range of virtual, augmented and extended reality projects
- Sharing creativity in extended reality and coding simulations within virtual platforms
- Resources for implementing VR/AR and Extended Reality in an inquiry classroom

Jason Milner, *ICT Integrator*, **Knox Grammar Preparatory School (NSW)**

15:30 CLOSING | Closing remarks from the Chair

Teresa Janowski, *Founder and CEO*, **STEM Fast Track (SA)**

15:40 END OF CONFERENCE