



HANDS-ON LEARNING
for teachers and lab techs
at CONASTA 64

PERTH 2015

CONASTA 64 SCIENCE: A KALEIDOSCOPE OF WONDER AND OPPORTUNITY

CONFERENCE REPORT

Bernadine Hunneybun and Sue Doncon, CONASTA 64 Convenors

CONASTA 64 KICKED OFF WITH REGISTRATION and the Welcome Function at the Central Institute of Technology, East Perth Campus. This was a warm, friendly and fun social barbeque, catching up with old friends and making new ones. The night commenced with a welcome for about 50 first-time CONASTA delegates with ASTA and STAWA councillors interacting in a Q&A session. Food and drinks flowed. STAWA's patron, Professor Lyn Beazley, welcomed everyone to Perth and CONASTA64 and invited them to have an interesting and educational conference. Tours of the Central Institute of Technology's Green Skills Building offered a unique insight into the possible energy efficiency of new buildings.

Monday morning delegates were entertained by Professor Fiona Wood's presentation on 'Striving for excellence in health care'. Following this were four interesting concurrent keynote speakers: Dr Kaylene Young on 'Our changing brain, a stem cell story'; Professor Simon Lewis presented 'Contacts

that leave traces: A beginner's guide to forensic exchange evidence'; Professor Peter Klinken who discussed 'The future of science in WA'; and Dr Sabine Streller's presentation 'Once upon a time—Fairy tales in science lessons'. This was followed by 70 workshops over four sessions catering to everyone's tastes. Monday culminated in the Conference Dinner at Government House where a superb night of dining and dancing ensued after addresses by the Governor of Western Australia, Her Excellency the Honourable Kerry Sanderson AO and Professor Lyn Beazley.

The first day of the conference included a specific primary stream in the workshops. Approximately eighty primary and early childhood teachers attended and experienced a diverse and engaging range of presentations and trade exhibits. Sabine Streller from the University of Berlin also presented her project to primary delegates on developing primary science modules based on common fairy tales. This was used as a springboard to engage students in science investigations and also to increase primary science teacher's confidence and science knowledge when actively planning and delivering the fairy tale modules.

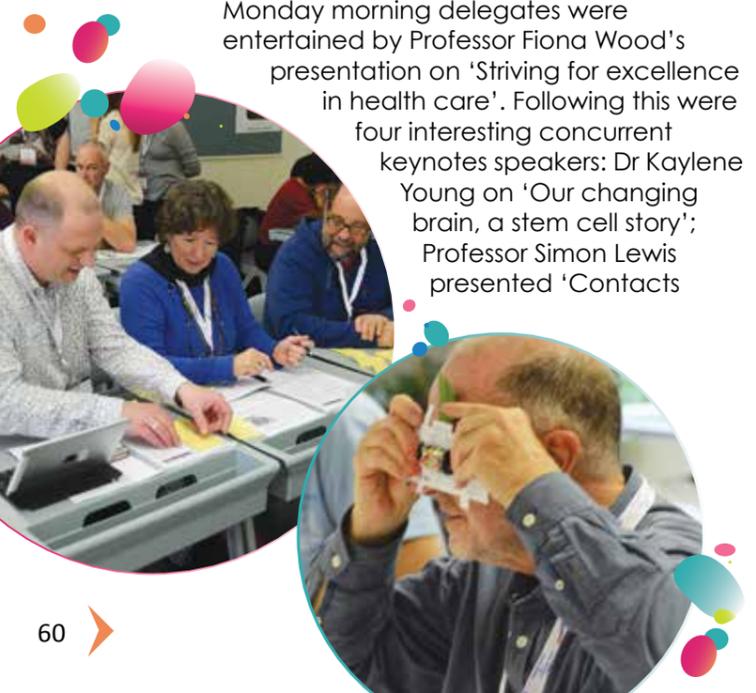
Science education technician's day was held on Tuesday 7 July and 85 technicians attended. Approximately half of the technicians came for the day and the remainder for the whole conference. The technician's keynote speaker, Dr Virginia

Ward, presented information on the global harmonising system of classification and labeling of chemicals (the GHS), which has been adopted in New South Wales, Tasmania, Queensland, the Northern Territory and South Australia as part of the harmonised work health and safety legislation and is before the WA Parliament at present. The technicians then attended concurrent speaker sessions on 'Dangerous Goods' or 'Science ASSIST'. For the remainder of the day they had a choice of 16 sessions covering many aspects of science. During the afternoon, Science Education Technicians Association (SETA)—the national technician's professional association—ran their forum at which Professor Lyn Beazley AO, the LABNETWEST Patron, launched the concept of an 'advocacy kit'. This will enable technicians to promote themselves and publicise their important role in education. There was much fruitful discussion. The whole conference was seen as a great success as it provided an informative platform for the technicians where they interacted, networked, learnt new processes and experienced a large professional conference, many for the first time.

For all other delegates the day began with Professor Iain Walker from the CSIRO speaking about the 'Public understanding of climate change: Wonder, opportunity, confusion and contradiction'. This was followed by three concurrent keynote speakers: Professor Claus Bolte speaking about 'Scientific literacy: A kaleidoscope

of desires, necessities, challenges and opportunities'; Dr John Morgan speaking on 'Astronomy: Revealing the hidden universe through science and technology'; and 'Looking at the past with futuristic technology' by Dr Kate Trinajstic. For the remainder of the day delegates took part in workshops chosen from a selection of 49 that covered all science disciplines, and attended one of two forums led by ASTA and SETA to discuss issues relevant to each organisation. Tuesday evening culminated with the Stanhope Oration. This was presented by the highly entertaining Dr Ian MacLeod talking about the 'Application of chemistry to conserve our shared heritage'.

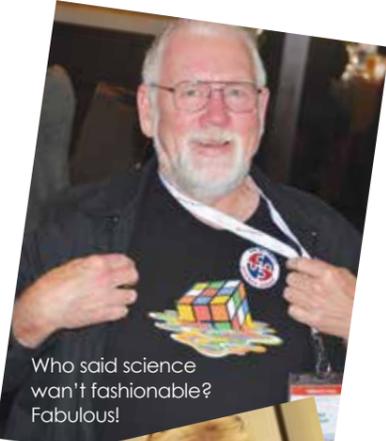
It was an early start with the Science Breakfast on Wednesday morning. We were woken up by three young scientists from Curtin University giving short presentations about their current research: Max Massi—a chemist looking into new luminescent chemicals for imaging; Sebel Pal—a lifestyle medicine researcher responsible for the research behind the A2 milk that you see ads for on TV; and Mark Zammit—a theoretical physicist who has developed the most accurate model of atom and molecular collisions to date, and recently won Student Scientist of the Year in the Premier's Science Awards.





Reflections of the 2015 Ruth Dircks Scholarship Awardee

Kate Argue, Science Specialist, Lake Windemere B-7 School, South Australia



Who said science wasn't fashionable? Fabulous!



Breakfast was followed by the main keynote presented by Professor Steven Tingay who discussed 'The Square Kilometre Array and its precursors'. The following concurrent keynotes were: Professor Ryan Lister's 'Exploring the epigenome'; Professor David Sampsom's 'Light for the future: The UNESCO international year of light'; and Dr John Goldsmith's 'Exploring astrophotography and digital imaging via "The Universe, yours to discover"'. Throughout the rest of the day, 63 varied and interesting workshops

enlightened delegates in science and science teaching. The Hawkers Hut night was a highlight with the mouth-watering smell of paella as well as the Asian and roast options available, tempting everyone. For the adventurous, a self-guided 'Pounding of the Perth Pubs' tour finished the night off perfectly.

On Thursday, Professor Garry Lee, straight off a flight from Singapore, got our taste buds salivating with his 'Cooking steak in the classroom'. Unfortunately fire restrictions at the Pan Pacific didn't allow us to taste the perfect steak that morning. This was followed by a choice of ten offsite workshops including the Gingin Gravity Discovery Centre and a behind the scenes tour at the Western Australian Museum with the highly entertaining Dr Ian MacLeod once again. Apparently, the trip to the picturesque Swan Valley to study the science of wine and rum at Olive Farm Wines and The Kimberley Rum Company was particularly well attended. This concluded the four days of fun and educational science with 547 friends, both old and new.

CONASTA 64 was a huge success with all delegates. Based on feedback from the participants, the conference was considered a huge success. Highlights of the conference were the passionate presenters, the opportunity to network with state and interstate colleagues, the great planning of the conference, the variety of sessions, being around inspiring and motivating people, the wide range of ideas and information presented, and the real classroom application.

Images courtesy of Lance Taylor, CONASTA 64 Organising Committee member.



Twitter was well and truly up and running during the conference, culminating in #conasta64 being the top trending hashtag in Australia at 10:42am on 6/7/15! Here are some tweets from over the four days:

- #conasta64 Welcome to country emphasising importance of environment to all living things—great science of our Indigenous peoples @stansw
- Feeling the love from Prof Fiona Woods—thanking all the teachers in this room, thanking her own teachers #conasta64
- Surviving serious burn changes your life— chances of cancer, chances of heart disease #CONASTA64
- #conasta64 Fiona Wood exceptional scientist, inspirational person, passionate practitioner. Emotive keynote—fantastic @stansw
- Making your brain image healthy body part increases rate of healing through mirrors & wii #conasta64
- @CONASTA Looking forward to hearing about neuronal Stem cells #conasta64 Dr. Kaylene Young.
- Awesome! Fairy tales in science lessons—a keynote with Sabine Streller from Germany #CONASTA64
- Peter Klinken WA Chief Scientist talking about investment in science or become a 3rd world country #CONASTA64
- #conasta64 maths provides a language for science by showing patterns



We are not alone.

Thank you to Ruth Dircks for the opportunity to attend CONASTA 64. I would encourage anyone to apply for the scholarship next year because, like me, it might be unexpectedly offered to you.

In this reflection, I would like to address an issue that has plagued me as a science specialist and one which the keynote speakers frequently alluded to. It is an issue which has ramifications for STEM education and improved student learning outcomes. It is the issue of collaboration.

In my role as a science specialist in a low SES (socioeconomic status) school, I have often felt isolated, both from the daily concerns facing classroom teachers and from colleagues who are employed in similar roles in other schools. CONASTA provided an opportunity to discover a vast network of experienced, enthusiastic and supportive professionals who are ridiculously passionate about their subject areas. There weren't corners in which people segregated into the separate disciplines and spoke language specific to their subject areas. There was instead a sense of camaraderie where ideas and resources were shared, all with the desire to improve professional practice and student learning outcomes, as well as build collaboration. As I return to my school, I have a renewed commitment to develop the local science teacher network. Through the workshops that I attended, and by talking with colleagues, I now have a much better idea of programs and presenters who can be linked into our partnership schools.

Woven through each keynote speaker's inspiring message, and especially the very moving 'Welcome to Country', was the concept that it is in collaboration with others that scientific advances into new and unimagined frontiers occur. The incredibly dynamic Professor Fiona Wood has built a collaborative team including scientists and clinicians from a variety of disciplines that together will change the future of burns care. When extrapolated into a school context, this might look like a collaboration between each of the science disciplines to achieve changes in student learning into the future. It is these students

that will carry on the work that our leaders in scientific research have begun.

One teacher spoke of a situation in her secondary school in which students from a biology class studying photosynthesis did not make the connections with the process of photosynthesis being concurrently taught in their chemistry class. We cannot assume that students join the dots. Surely our students will perform with more enthusiasm and success when concepts are investigated simultaneously across disciplines rather than in isolation. Imagine a school system in which the students' inquiry occurs across the disciplines and allows research in an holistic way. This is the reality in which the keynote speakers operate; is there anything stopping us from beginning the process in primary and secondary education? Maybe it is already happening at some sites. I wonder if it could happen across all.

This lack of collaboration leads on to the problematic STEM focus, which appears to be creating anxiety and uncertainty. How can the current approach to education address each of the aspects of STEM if each discipline is taught in isolation? How can engineering and technology exist without science and mathematics? As a primary school specialist I have much more freedom to offer the students opportunities to integrate the disciplines across a topic. I find the students enjoy investigating concepts and operate instinctively without reference to separate disciplines; however I worry about their enthusiasm as they enter secondary school. The lack of collaboration between the disciplines might leave them feeling as if the part of the picture that they are seeing carries little meaning because the dots just won't join together to make sense.

These are my reflections to ponder and address in my practice. I hope you have found something here to ponder too.



Kate receiving her award from Ruth Dircks, the eminent teacher whose generous donation founded the scholarship.