The STEM Ecosystem: Building cross-disciplinary leadership capacity in science, technology, engineering and mathematics

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From the Project Manager's desk

This is the fifth edition of the STEM Ecosystem Project Newsletter. In this issue we report on our third multi-disciplinary project at RMIT, the Urban Ecology Symposium Model and STEM staff and student involvement in the project.

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From the Project Leader:

Prof. Julianne Reid, Associate Deputy Vice-Chancellor Learning & Teaching, Curtin University, Project Leader
STEM Ecosystem Project

The STEM Ecosystem Project has delivered another multi-disciplinary learning and teaching project at RMIT University in Semester 1, 2015, the Urban Ecology Symposium. In this issue of the newsletter we report on the success of the project.

Another recent STEM Ecosystem Project achievement was presenting a full refereed paper presentation at the HERDSA 2015 Conference held in Melbourne in July entitled, “Navigating the lifelong learning boat through unchartered water”, McLaughlin, Kennedy and Reid.

Our project partner Universities, University of Sydney and University of Southern Queensland continue to work on their case studies in Semester 2, 2015. We expect the results from these case studies will be presented in the STEM monograph and final report (December, 2015).

The STEM Ecosystem Project is planning a STEM Expo and STEM monograph launch early, 2016. This will provide an excellent capstone for the project.

Making the Case for STEM Skills for Everyone:

Four Common Myths about STEM

Myth #1: Engineering is all about gadgets and circuits

The engineering mentality and approach are needed in almost all aspects of society.

Myth #2: STEM is about standardized multiple choice tests

STEM education encourages the development of critical thinking skills, risk taking, tolerance for and even celebration of failure and thinking outside the box.

Myth #3: The world already has too many scientists

Very few STEM students become "Scientists" most STEM literate students follow more regular non-technical careers in an increasingly complex highly connected world.

Myth #4: STEM is only appropriate for those planning to be engineers or scientists

Many non-STEM jobs have become STEM jobs, especially in the trades. STEM is not only for PhD researchers, it is for all of us.

Reference:
Cross-disciplinary learning and teaching project at RMIT University

Case Study 3: Urban Ecology Symposium

Ed Horan, Civil, Environmental & Chemical Engineering

The Urban Ecology Symposium “EcoCities” (http://iuue.org/) formed part of the STEM Ecosystem project and presented a new model of understanding and applying STEM knowledge for students from a range of disciplines. The symposium model was conducted over a three day period in March 2015 at RMIT University, and included interactive learning spaces with over 150 industry, undergraduate and postgraduate students and academics working on “live” industry problems of urban ecology.

Urban Ecology Symposium, 2015: Opening address

The concept behind the Symposium was to promote a stimulating, interactive learning environment for students from a range of disciplines to gain from exposure to STEM industry experts and academics in a “real-world” work environment. Industry facilitators from urban ecology disciplines as diverse as transport and food conducted workshops where students and industry attendees participated in defining problems within the over-riding constraints and boundaries of the City of Melbourne. Workshop groups worked through specific urban ecology problems such as waste management in a large city, food storage and supply, sustainable living, transport and logistics to arrive at real-world, credible and sustainable solutions. Workshops were of varying duration depending upon the problem, the solution and the capacity of the participants. Solutions were allowed time and space to be presented.

Urban Ecology Symposium, 2015: Question time

The model of the symposium was built upon a collaborative international pilot course jointly offered by the Master of Sustainable Practice Program at RMIT and the Architecture and Design Department at Wismar University in Germany in March 2014. Students from both of these programmes had participated together in credit point workshops examining urban ecology issues in 2014. Specifically the pilot course was aimed at addressing the major issues of climate change and meeting sustainability criteria providing a foundation for multi-disciplinary involvement from sectors of RMIT University in Melbourne and Wismar University in Wismar, Germany.

FutureHealth CONNECT Summit, Melbourne, 21-22 April, 2015

Daryl D’Souza, Computer and Science Information Technology

Daryl D’Souza, an RMIT University STEM academic, attended the CONNECT Expo in April 2015 and has written a short report for our newsletter.

The CONNECT EXPO events were inaugurated in 2014 to build awareness around opportunities presented by a digital world. CONNECT EXPO 2015 comprised 11 conferences and an “emerging tech” EXPO targeted at “senior business and technology leaders, developers, entrepreneurs, investors and technology enablers to learn, network and do business” (www.connect.com.au). CONNECT EXPO claims to be Australia’s fastest growing business event with a focus on disruptive and emerging technologies.

Of note was the FutureHealth subconference, featuring two keynote presentations, four panel sessions and 14 short presentations over two days. The conference was chaired by Dr George Margelis, Adjunct Professor, TeleHealth Research & Innovation Laboratory, UWS. Dr Margelis has had a long-standing career as a medical practitioner with an ongoing interest on telehealth.

The highlights of the Expo were the keynotes by Dr David Agus (http://davidagus.com/) and Tim Kelsey (http://www.england.nhs.uk/publications/blogs/tim-kelsey/). David Agus presented, among other things, the need in Australia for healthcare technology startups, common in the USA. Tim Kelsey provided a fascinating account of the transformation from a paper based health service to a fully patient-centric EMR-based system. Other interesting ideas presented at the event included, the expanding tele-health industry and the notion of the hospital being less central to patient care, real-time patient access to information including EMRs, translating data into disease prevention through analytics technology and the fully digital hospital.

The focus of the four panel sessions was very much driven by the technology and patient theme: best practice technology to transform healthcare delivery to keep the patient home longer; data management for improved business and clinician performance; empowerment of patients through information access; technology to better engage providers and patients.

The opportunities offered by technology will not only change healthcare in future but may also radically redefine healthcare. Technology and healthcare are inextricably linked, each one being a catalyst for the other. A collaborative discourse around such synergy between technology and health is imperative at both teaching and research levels and with all relevant RMIT stakeholders.
In December 2014, through a combination of passion and hard work, James completed a Bachelor of Environmental Engineering with first class honours. His achievements were further recognised by being short-listed for RMIT’s Award for Higher Education, and being presented with an Australian Postgraduate Award. James is currently undertaking a PhD to investigate the relationship between mixing and the performance of anaerobic digestion, which is a fundamental tool in addressing sustainability in organic waste management.

James was involved in the STEM Ecosystem, Katherine Project in Semester 2, 2014. James was enrolled and involved in Engineering Design for Sustainability and worked in multidisciplinary teams (plumbing apprentices, engineering undergraduates and health science students) to deliver a water supply solution for two remote communities near Katherine in the Northern Territory. James was one of eight RMIT students invited to showcase his group’s work at the Worldskills National titles in Perth in 2014 (http://www.worldskills.org.au/?s=RMIT&x=11&y=9).

When asked about the Katherine Project experience, James commented:

The best thing about being involved in the STEM Ecosystem Project was working with other students who had various levels of experience and a wide range of backgrounds, all within a supportive and developmental environment. I feel it has been an excellent bridge from a typical single discipline group project to something much more indicative of a real world environment.

A significant outcome from the project for me personally was the introduction to communities we were working to help and meeting one of the community elders. This has given me a much more personal connection with the challenges faced by these remote communities and the desire to leave a much better legacy for future generations.