

SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)

Lift Off - Secondary Space Education (2)

Author: Mr. Mark Gargano
Curtin University of Technology, Australia

Prof. Marjan Zadnik
Curtin University of Technology, Australia

EXPLORING AND ENGAGING EARTH AND SPACE SCIENCE EDUCATORS

Abstract

Science ranges from hypothesising, observing and experimenting, theory and prediction through to problem solving and prompting us to create inventive solutions to the dynamic challenges in the world around us. It is through research and education that members of societies are empowered to make the choices and changes essential for a sustainable future. In the latter years of the 20th century, the decline in student enrolments in STEM disciplines beyond the compulsory years is at odds with creating the next generation of productive, scientific literate members of society. At the heart of the matter is the engagement of teachers to demonstrate the connections between research, fieldwork, laboratory and classroom. The National Aeronautics and Space Administration (NASA) has created an innovative program Spaceward Bound that brings together teachers, scientists and engineers in the field, studying current space science projects in remote locations across the Earth. Since its inception in 2006, 17 field expeditions have occurred in five continents. Beginning in 2011, teacher participants were surveyed and the data is being analysed to better understand current classroom practices, attitudes, motivation to Earth and Space Science, leading to a snapshot of current professional self-efficacy of teachers in science classrooms. Through a combination of correlating the 22 question pre-expedition survey with the 16 question post-expedition survey from 20 teachers, plus interviews with key participants, we have a better understanding of the current state of Earth and Space Science classrooms, and highlighting pedagogy from highly motivated teachers. The surveys are also indicating limitations and points for future developments in teaching behaviours and teachers skills, which are a current ongoing focus with the 2012 Spaceward Bound participants. A key point of participating in teacher professional learning, such as Spaceward Bound is the intended long-term effects on the learning-teaching cycle, and the value of activities such as these for educators. Data from longitudinal studies highlighting implementation of course work, inclusion of practical work, links to the original professional learning experience are being examined to gain an understanding of teacher motivation in science. There are many programs and specialist science centres, such as the Gravity Discovery Centre in Western Australia, which offer opportunities to enhance skills and knowledge for K-12 practitioners, which would benefit from examination of findings from the generated data from this research. Intended outcomes of this teacher professional learning is to enhance classroom techniques, teacher self-efficacy and expanding our future space science workforce.