# PROCEEDINGS OF THE AUSTRALIAN CONFERENCE ON SCIENCE AND MATHEMATICS EDUCATION 2012 (18th Annual UniServe Science Conference)

## SEPTEMBER 26TH – SEPTEMBER 28TH 2012
## THE UNIVERSITY OF SYDNEY

### TEACHING AND LEARNING STANDARDS: WHAT DOES A STANDARD MEAN TO YOU?

Editors: Manjula Sharma and Alexandra Yeung

Published by: UniServe Science, The University of Sydney, NSW 2006, Australia
ISBN: 978-0-9871834-1-5

# EDITORIAL

Conversations about improving the quality and standards of our students and teachers in primary, secondary and tertiary institutions occur daily, both nationally and globally, in the media, in our institutions and between neighbours. The question that everyone is asking is whether our schools and tertiary institutions are preparing students and graduates for professions and citizenship in the 21st century. Such questions are also being asked in tertiary institutions where concerns of falling standards are coupled with perceptions that the quality of our Science and Mathematics graduates is not what it used to be. We are now well clear of the days when universities were the place where only the brightest received a berth, many to be future scientists on a research track. It is unlikely though that these halcyon days ever existed, where all graduates were of high quality; proficient at learning and understanding and skilled at communication and team-work.

Whether our current graduates will be rigorous, sceptical analysts and learners who question science/mathematics concepts and theories and also have the problem-solving, communication, team-working and creative abilities needed for the 21st century remains uncertain. Our anxiety surrounding such uncertainty has heightened as student participation in tertiary institutions has increased and as we have more explicitly broadened the basis of what we expect our graduates to be able to know and do. These broadened expectations of graduates, once perhaps tacit, are now clearly articulated in the “Threshold Learning Outcomes” for Science and Mathematics (Jones & Yates, 2011).

Now that we have articulated our vision of what we want and need our Science and Mathematics graduates to know and be able to do the question remains can we achieve it? How we will know when we have improved the quality of our Science and Mathematics graduates, especially if we did not know what the standard was before? We are now in a tertiary future where the significant work of academics is to teach this broader, more diverse student base, where we will be asked to provide evidence to certify that our students have reached “standards”. Can we measure the standard we want our students to reach? Our greatest resource and our main leverage to do this lies within ourselves; academics and academic practice.

This proceedings of the Australian Conference for Science and Mathematics Education (ACSME) represents the collective contributions of academics who are committed to ensuring evidence-based practice in improving the quality of learning and teaching in Science and Mathematics within our tertiary institutions. You will read about the work of academics that have passion and energy for their disciplines and a desire to instil the same love of learning in their students so that they are equipped for an uncertain future. It is this approach that makes the challenge of producing quality Science and Mathematics graduates achievable. It is through conferences such as ACSME, where academic practice is shared, collegiality is nurtured and new understandings are reached, that we better understand the strategies needed to create graduates who have critical thinking skills, disciplinary knowledge and flexibility to make a productive contribution to our technologically, complex world.

## REFERENCES

Jones, S. & Yates, B. (2011). *Science Learning and Teaching Academic Standards Statement [PDF].* Retrieved September 3, 2012 from http://www.olt.gov.au/resource-learning-and-teaching-academic-standards-science-2011

Associate Professor Pauline Ross
Chair, Australian Conference for Science and Mathematics Education

## EDITORS



## REVIEW PANEL



The Proceedings of the Australian Conference on Science and Mathematics Education contains three types of papers:

- **Full Refereed Papers** which have been peer reviewed by two independent experts and satisfy the Australian DEST E1 category.
- **Full Written Papers (non-refereed)** which have been subject to editorial assessment and satisfy the Australian DEST E2 category.
- **Abstracts** (extract of paper) which have been subject to editorial assessment and satisfy the Australian DEST E3 category.

We look forward to seeing you at the Australian Conference on Science and Mathematics Education (18th Annual UniServe Science Conference).