Editorial

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> Around two-thirds of the Victorian population (65%) is interested in science with a quarter (25%) not interested in it. Yet only about a third of the population (37%) engages with science regularly and just 10% feel very well informed about science.

This gap between interest and engagement was identified in *Community Interest and Engagement with Science and Technology in Victoria*, a 2007 research report prepared for the Victorian Department of Innovation, Industry and Regional Development (DIIR).

How do these community-based results relate to interest in science at school and as a career?

Some areas of science carry the perception that pursuit of a career is too risky. Daniel Edwards of the Australian Council for Educational Research (ACER) reports (p.4): "Making the choice to undertake a higher research degree in the sciences in Australia is seen by many current students and recent graduates as a risky decision, especially if the desire is to work in research in Australia following graduation". The ACER findings support the perception of risk in some areas, such as limited private sector career opportunities for those with PhDs and the steady decline of tenured positions in university science faculties.

John Prescott (p.10) has been watching Australian employment prospects for physicists for 25 years. He acknowledges the role of the Australian Research Council in helping those with a PhD to remain in the workforce, but says that "physicists on limited-term fellowships continue to be faced with insecurity… and a significant number are in their second or even third limited-term appointment". Perhaps surprisingly, he comments, given the gloomy attitudes of some physics students, is the relative stability in the demand for physics graduates over the past three decades.

Evidence of declining interest in science subjects at school supports the interest–engagement gap in an educational context.

Peter Pentland of the Australian Academy of Technological Sciences and Engineering (p.20) cites an Australian Council of Engineering Deans report identifying "a shortfall of about 30,000 engineers available to undertake known or available engineering work [in part because] participation rates in the sciences and mathematics at the upper secondary level have been steadily declining over the past 30 years".

Hyam Rubinstein of the University of Melbourne (p.8) discusses education trends in mathematics, and says that "[between] 1995 and 2006, substantial problems have become apparent. The number of school students studying the advanced and intermediate Year 12 mathematics courses required for entry into technological and physical sciences and engineering courses has dropped alarmingly".

The workplace corollary of these declines is a shortfall in maths and science graduates, a situation that is predicted to worsen. In response, the Australian Mathematical Sciences Institute was formed to work with industry, students and teachers. More recently, the Science and Technology Education Leveraging Relevance (STELR) project was developed "to increase the retention rates in sciences and mathematics at the upper secondary level by showing students that science is relevant to their lives" (p.20).

Students that do follow the path to a science career may find their skills wanting when entering the workforce. Nick Besley at RMIT University discusses work-integrated learning through placement programs (p.15). Through such programs, students have the opportunity to apply skills learned at university while obtaining invaluable professional experience.

Rachael Quigley of the University of Technology, Sydney, uses the phrase "renaissance students" to describe students with that sought-after combination of skills that

constitute a "work-ready" graduate. The Work-Ready Wiki is a virtual opportunity for work-integrated learning, "a living, online collection of professionally contextualised learning activities designed to assist academics to foster work-readiness in their students" (p.18).

How has the gap identified by the DIIR study come about? According to the DIIR report, the answers lie in access to and presentation of information, and thus audience comprehension.

According to Peter Darben of the University of Queensland (p.24), "students consistently tell us that although they find science interesting, they are deterred from pursuing science studies because they see it as 'mainly based on remembering a lot of facts'". Hands-on activities that can heighten student interest are often restricted by class time and by access to and affordability of resources. The Students Performing Advanced Research Queensland "research-immersion" educational facility was born earlier this year to address this problem. Senior secondary students attend a week-long program alongside biomedical scientists at the Diamantina Institute.

A virtual resource stimulating interest in science careers is the World Wide Day in Science. This annual event showcases the career paths of over 1000 scientists (p.29). Students can find science careers that match their own interests and aspirations. For female professionals seeking online career information, Women in Technology (WiT) provides professional support in the ICT and biotechnology fields (p.35).

Within the tertiary education system, a "cultural change" can help students make the sometimes difficult transition from secondary school, according to Mary Peat and Charlotte Taylor of the University of Sydney (p.40). Through a range of induction workshops and activities, science students can form relationships with peers and mentors, gain confidence and become enthusiastic about university life.

Good teaching is often responsible for sparking student interest in science. Rebecca Cooper and Stephen Keast of Monash University shared their experiences of learning about teaching science as teacher and teacher-educator, respectively (p.44). Their self-study model "was useful for the pre-service teachers to reconsider their beliefs about good science teaching and learning and for us to consider ours about teacher education".