Broadening Indigenous participation across the disciplines:

Australian Council of Deans of Education Annual Conference September 2014

Professor Ian Anderson
Co-Chair
Aboriginal and Torres Strait Islander Higher Education Advisory Council
Aboriginal and Torres Strait Islander Higher Education Advisory Council
ATSIHEAC policy development framework

1. Broadening access across the disciplines
2. Whole of University Strategy
3. Academic Workforce
4. Sustainable financing
5. System level performance monitoring
Why STEM?

• 11% of Indigenous people are employed in professional occupations, compared to 20% of non-Indigenous people

• Most common occupation group for employed people:
  • For Indigenous people - Labourer (24%)
  • For non-Indigenous people - Professional (20%)

• Participation clustered in three fields of study

• STEM education critical to enhancing broader range of educational and employment opportunity

*Drawn from Census data 2006 and 2011*
Only two per cent of Indigenous students were top performers in scientific literacy compared to 14 per cent of non-Indigenous students and an average of 8 per cent of students across the OECD. At the lower end of the proficiency scale, 37 per cent of Indigenous students failed to reach Level 2 compared to 13 per cent of non-Indigenous students and 18 per cent on average across the OECD.

Half of the Indigenous students failed to reach Level 2 and half of these students performed at below Level 1, that is, one-quarter of Indigenous students would be likely to have serious difficulties in using mathematics to prepare them in meeting future challenges. The proportion of low-performing Indigenous students (51%) was more than twice that of non-Indigenous students (18%) and the OECD average (23%).

Science Literacy and Science Interest

Retrospective analysis of PISA 2006 (McConney et al 2011):
• Indigenous science literacy lags non-Indigenous literacy by about 83.5 points (0.76 standard deviation units)
• Indigenous science interest led that of non-Indigenous students by 10 points (0.1 SD)
• Regression modelling: Reading Literacy accounted for 62 per cent of science literacy variance
Implications for schools

• There is a gap in achievement (science literacy)
• The gap is not a result of lower interest in science but instead mainly associated with reading literacy
• Use interest in science to improve reading literacy
  • Recognise that science is more than facts and definitions and knowledge in science can build on what students know
Science Engagement and Literacy

Analysis of 2006 PISA Indigenous/Non-Indigenous Australian and NZ Students (Woods-McConney et al., 2013):
• There is a gap in achievement (science literacy)
• The gap is not a result of lower interest in science but instead mainly associated with reading literacy

Use the interest in science to improve reading literacy
• Recognise that science is more than facts and definitions and knowledge in science can build on what students know
Implications for practice

- Relationship among factors in science literacy and engagement not completely understood
- Engagement in science not always associated with high science literacy
- Engagement in science is valuable on its own, not only as a precursor to science literacy
- Connecting out-of-school activities to ‘school science’ may help improve engagement in science for all students
Analysis of High Performing Indigenous Students (PISA) unpublished: KEY MESSAGES

• Celebrate Success of high performers
• Need to better understand the relationships that and factors in high performing Indigenous studies
• Positive association with teacher led strategies. Negative correlation between student led investigations and high performance (for both Indigenous and Non-Indigenous)
• Affective Issues: higher interest in science could be capitalised on. High Indigenous performers have positive profiles compared to all Indigenous and all non-Indigenous
• SES correlation strong. Need to understand this.
Indigenous participation in science - enrolments

Natural and Physical Sciences Enrolments (Indigenous and all students), 2005-2013

Natural and Physical Sciences enrolments - all students

Natural and Physical Sciences enrolments - Indigenous students
Indigenous participation in science - completions

Natural and Physical Sciences Completions (Indigenous & all students), 2005-2013

- All students
- Indigenous students
What can Deans do?

• ACDS – Enhanced Training of Mathematics and Science Teachers project (build Indigenous focus)

• Engagement and Success in Teacher Education (build STEM focus)

• Respect, Relationships and Reconciliation (explore STEM focus)
Supporting student success

Ian: do you have an image we could use in this slide – one of students doing STEM-related studies – one that you have permission to use?