



Submission to the Education, Employment and Workplace Relations References Committee's inquiry into higher education and skills training to support future demand in agriculture and agribusiness in Australia

1. WHO ARE WE?

The Primary Industries Education Foundation was formed in 2008 to address widespread concern about the way children, young people, and their families have become disassociated from where their food and fibre originates, the processes involved in modern primary production, and their lack of understanding in what is required for a healthy diet and lifestyle. There is also concern that most are unaware of the many opportunities in primary industries for challenging and rewarding employment and careers.

The Foundation is a tripartite, not-for-profit company limited by guarantee, through a collaboration of the Australian Government, primary industries organisations and the education sector. Members include Meat & Livestock Australia, Fisheries Research & Development Corporation, Forest & Wood Products Australia, Cotton Australia, Commonwealth Department of Agriculture Fisheries & Forestry, CB Alexander Foundation, National Association of Agricultural Educators and Australian Council of Deans of Agriculture.

Its mission is to inform students, teachers and the broader community about the primary industries and the career opportunities which they offer. The objectives of the Foundation are to:

- provide a national leadership in the coordination of initiatives to encourage primary industries education in schools through a partnership between industry, government and educators;
- commission, coordinate, facilitate and manage national projects to encourage primary industries education in schools;
- provide a source of credible, objective and educational resources for schools to maintain and improve community confidence in Australia's primary industries; and

- communicate primary industries research and development outcomes in a format accessible for schools and encourage interests and skills in primary industries related careers.

The Foundation's current focus is the collation and quality control of existing resources and curriculum units as well as the commissioning of new high quality teaching resources tailored to all aspects of the school curriculum and for all year levels. These are being placed on the Foundation's website www.primezone.edu.au which will be promoted to all teachers through education media and through workshops and professional development programs in the near future. In short, we aim to make it easier for teachers to meet their teaching and curriculum requirements using primary industries contexts.

2. OVERVIEW:

The Foundation submits that the challenge of influencing higher education and skills training in Australia to support future demand in primary industries and agribusiness must be considered, not as an isolated sectoral issue, but within a whole-of-education context.

This is due to interest in primary industries and its careers starts early in a child's development in primary school and develops through the entire schooling experience. In addition, decisions around primary industries and agribusiness careers are heavily influenced by parents and teachers, most of whom have very little knowledge of contemporary primary industries.

In light of these findings, a whole-of-education strategy would offer government and industry the greatest return on educational investment, particularly if that strategy integrates with the school curriculum at early primary level and continues right through to late secondary.

Teachers are the key. Reaching and influencing Australia's 286,000 teachers is a massive task - requiring a heavy emphasis on 'practice' rather than 'policy'. This includes providing them with high quality tools, training and industry networks that are structured to help them deliver against their curriculum goals.

Yet most school based initiatives aiming to incorporate primary industry contexts into the classroom have failed because they are poorly conceived, too narrowly focused (to one specific industry sector for example), under-resourced, have no or inadequate teacher professional learning components to the activities, or are not designed with teachers' needs, capabilities and capacities in mind.

Encouragingly, across all primary industries there is a strong desire to better engage with the education sector. But in order to do so, effective engagement requires acceptance of a comprehensive and collaborative vision and substantial government support to help bring it to fruition.

3. ADDRESSING THE INQUIRY'S OBJECTIVES:

"An Australian community which understands and values its primary industries"

3.1 THE PROVISION AND CONTENT OF HIGHER EDUCATION AND SKILLS TRAINING FOR AGRICULTURE

The Foundation considers that other agencies and industry participants are better equipped to provide advice on the overall status of higher education and skills training for primary industries.

However, the Foundation does note that primary industries education is a high fixed cost, relatively low enrolment endeavour for a comprehensive university. Given this high fixed-cost structure, the low marginal cost of additional student numbers suggests that efforts to increase the flow of students for both vocational and higher education pursuits should be a priority.

Additionally, there ought to be opportunities for greater cross industry and cross institution collaboration to increase efficiencies in the sector. These include but are not limited to, clearer pathways from vocational training into tertiary primary industry related programs, and clearer recognition from universities for school based primary industries subjects programs to encourage student's to enrol in these school programs and gain exposure to the industry at an earlier age.

3.2 THE ADEQUACY OF CURRENT EDUCATIONAL ARRANGEMENTS IN MEETING THE AUSTRALIA'S AGRICULTURAL LABOUR MARKET NEEDS

In considering this question, the Foundation offers the following observations.

3.2.1 Interest in primary industries and agribusiness careers starts in primary schools.

Many academic studies highlight that influences on career choice begin at a young age.

A survey of first year science students at The University of Queensland by Miller et alⁱ found that around 40% first started thinking about a science career while at primary school or earlier, rising to over 60% by early secondary school.

These findings are consistent with the broader Australasian Survey of Student Engagement 2010 study which found that up to 40% of first-year university students first contemplated university while at primary school. Study author Dr. Hamish Coates has been quoted as saying "*There has been an assumption that people make the decision to go to university at 15 or 16, but this reveals a lot of students start to consider it back in primary school*".ⁱⁱ

Therefore any strategy to increase student awareness and interest in pursuing agriculture and agribusiness careers must include the entire schooling system K-12 and not just focus on mid to late secondary.

3.2.2 Student interest in primary industry careers is heavily influenced by parents and teachers and by their enthusiasm for the field.

According to the Miller study, parents exercise the strongest influence on career choice (54%), followed closely by workers in the field (36%) and friends (34%).

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However, a 1999 Victorian study of Year 10 students by Matthews & Falveyⁱⁱⁱ found that, 57.3% of all respondents gained their knowledge of careers in agriculture from schools/teachers, followed by parents/relatives (52%), media (46.4%), and friends (27.1%). Among metropolitan respondents, schools/ teachers rated significantly higher than for non-metro students (61.4% vs 51.3%) while parental sources heavily outranked schools/teachers among non-metro students (64.6% vs 43.2%).

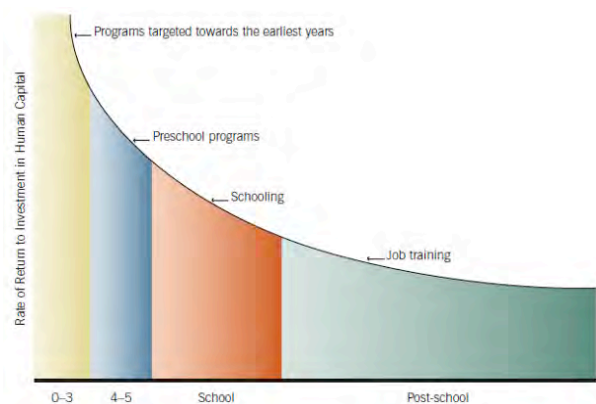
Clearly, the task of educating parents directly on primary industries career opportunities for their children is probably beyond the capabilities of governments and of the Foundation. But the role played by schools and teachers does represent a critical opportunity that can and should be pursued.

3.2.3 Return on educational investment is greatest when children are introduced to concepts at a young age.

Nobel Laureate Professor James Heckman emphasises the high rates of return on human capital that comes from investment in early childhood development, and demonstrates how those rates of return diminish as the child grows^{iv}.

Whilst a child's cognitive development that's used for understanding an industry and

later for making career choices, does increase with age, the Heckman model reminds us how a 'soft' introduction into primary industries and agribusiness concepts at a very young age can, if maintained throughout the child's schooling, be a very efficient investment in building a base for a growing appreciation and interest in primary industries and subsequently the career pathways they offer.



Source: Heckman and LaFontaine (2007)

3.2.4 Addressing these issues requires both short and long term strategies.

There is a multitude of national, state and industry based programs delivering targeted vocational training to help meet immediate workforce needs, but few (other than tertiary courses) appear to be addressing the longer term challenges.

As identified in the 'Workplace, Training and Skills Issues in Agriculture report to PIMC Oct 2009'^v, there are some 136 workforce, skills and training initiatives being undertaken in Australia. Yet in spite of these valuable initiatives, labour and skills shortages continue to pose significant challenges for government and industry.

ACER's benchmark study for the Foundation on student and teacher attitudes to primary industries^{vi}, identified that there appears to be reasonable awareness and positive attitudes evident in Australian primary and secondary students, yet primary industries appears to lack salience as a career choice – it is just not being even thought about by most as an option. And as current school students represent the next generation of Australia's key influencers on student's (namely parents and

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teachers) - if they continue to suffer the same minimal contact with food and fibre production as the current generation of influencers has, this situation can only worsen.

Clearly, a longer term, more integrated and comprehensive strategy to elevate the consciousness of primary industries among students and teachers is required as a matter of urgency.

3.2.5 The task of reaching all students and teachers across the Australian educational system is massive.

According to ABS^{vii}, there are 9,468 schools in Australia of which 6,357 are primary, 1,409 are secondary, and 1,286 are combined. Of the 286,000 teachers, 128,000 FTEs are in primary schools and 124,000 FTEs are in secondary schools. There are 3.5 million students in Australian schools, 2 million of whom are in primary and 1.5 million in secondary.

The Foundation's 2010 national stocktake of educational initiatives relating to primary industries identified over 1,000 programs and activities (and not including vocational training programs referred to above). Unfortunately, most of these well intentioned programs fail to achieve their long term objectives because of very low reach (symptomatic of limited education sector engagement and understanding of how school's operate), lack of sustained resources, and burn-out of program champions.

3.3 THE IMPACT OF ANY SUPPLY AND DEMAND DISCREPANCIES ON BUSINESS, RESEARCH, AND THE ECONOMY MORE BROADLY

The Foundation is not in a position to comment on this question.

4. ADDRESSING THE INQUIRY'S SPECIFIC CONSIDERATIONS:

4.1 THE ADEQUACY OF FUNDING AND PRIORITY GIVEN BY GOVERNMENTS AT THE FEDERAL, STATE AND TERRITORY LEVEL TO AGRICULTURE AND AGRIBUSINESS HIGHER EDUCATION AND VOCATIONAL EDUCATION AND TRAINING

The Foundation acknowledges with gratitude the contribution of, and support from, DAFF in assisting the Foundation become established and continuing as a valued member. It also acknowledges the funding and support of its industry based Research & Development Corporation members.

While the Foundation does not have a mandate to comment on, nor comprehensive data on the extent of funding and priorities by all levels of government, it does wish to draw the Committee's attention to the following observations

4.1.1 Funding of school intervention programs for primary industries appears to be disjointed and lag well behind educational investments in similar areas such as financial literacy and science.

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The Foundation notes the Government's contribution of \$10m over 3 years to support the Financial Literacy Foundation to train teachers, and produce and promote financial literacy resources aligned the Maths curriculum^{viii}.

The Australian Academy of Science has been granted significant funds over many years in developing and promoting science based teaching resources, 'Primary Connections' and 'Science by Doing'.

The Commonwealth Department of Health has contributed \$12.8m over 4 years, DEEWR \$1m over 3 years and Qld and Vic state governments \$4.5m to the Stephanie Alexander Kitchen Gardens Foundation, a program which, according to its annual report, has been taken up by only 259 of the 6,357 primary schools since 2004^{ix}.

By comparison, a number of worthy primary industry programs attract only modest, or no funding from a range of Commonwealth departments.

Rather than appearing critical of the above programs, the Foundation is fully supportive and uses these examples only to demonstrate the scale of investment and the coordinated strategy necessary to make a significant impact across the education sector.

4.1.2 Industry and commercial funding contributions to joint educational programs are proving difficult to secure and retain.

Parochial interests applying across industries, corporations and states typically drive fragmentation of educational programs to a point where none achieve the necessary presence among the mass of Australian teachers or fully achieve the outcomes desired. Hence, the substantial efforts and funds currently invested are largely wasted.

Yet, if the primary industries are to achieve their educational goals, they must focus on the practical day-to-day needs of the teachers and their students. Teachers are not interested in promoting specific industries, nor do they have the time, and in the majority of cases the motivation, to find and adapt existing industry produced classroom resources. But they have been shown to be keen for high quality educational resources that meet their specific teaching needs. And the role for an independent peak-body is critical in providing credibility to such initiatives.

Unfortunately, for many enterprises and industries, investing in 'whole-of-primary industries' contexts that do meet teachers' needs doesn't necessarily 'tick the box' for their stakeholders.

Even so, the funds and resources available from such enterprises and industries are substantial. But they may need government incentives to draw them out and contribute to collective and coordinated educational programs that can truly make a difference.

4.2 THE REASONS AND IMPACTS OF THE DECLINE IN AGRICULTURAL AND RELATED EDUCATIONAL FACILITIES

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The PIMC report (referred to earlier) canvasses well the range of impediments to addressing the labour and skills shortage and it would be superfluous for this submission to repeat those.

However, not included in the PIMC report is evidence from the ACER study that there appears to be a widespread lack of consciousness and relevance among both teachers and students, with only 15% of students surveyed having considered a career in agriculture. Some 85% of year 10 students indicated they would not consider a career in agriculture. Much work must be done urgently to address this gap in student knowledge and understanding if we are ever to attract and retain a skilled work force for the primary industries sector.

4.2.1 Teachers lack the personal experience to educate, stimulate and encourage their students towards primary industry-careers.

This low saliency of primary industries among teachers and students is hardly surprising given that, according to the ACER study,

- 95% of primary teachers surveyed had not formally studied any primary industries subjects at University;
- 0% of teachers had undertaken any study relevant to the forestry sector; and
- 0% of year 6 teachers surveyed and only 3% of year 10 teachers surveyed had participated in any formal fisheries education.

Despite this, after prompting, 100% of primary teachers and 91% of secondary teachers surveyed rated increasing student knowledge and understanding of food and fibre production as either somewhat or very important.

4.2.2 Agriculture is not seen by students to be a progressive industry

Again from the ACER survey,

- 43% of students surveyed did not link scientific research with primary production;
- 55% of students believed modern primary production was not innovative;
- Only 54% of Australian students surveyed linked primary production with scientific research when prompted.
- Only 45% of students linked primary production with innovation.

Additionally, a similar study conducted by Farm and Countryside Education (FACE) in the UK indicated that only 7% of students thought farmers needed skills in IT^x.

4.3 SOLUTIONS TO ADDRESS THE WIDENING GAP BETWEEN SKILLED AGRICULTURAL LABOUR SUPPLY AND DEMAND

4.3.1 Clearly, schools have a vital role to play.

Of course there is no single, simple or short term solution. But a focus on short term needs masks the longer term threats already apparent within Australia's schools and the broader community.

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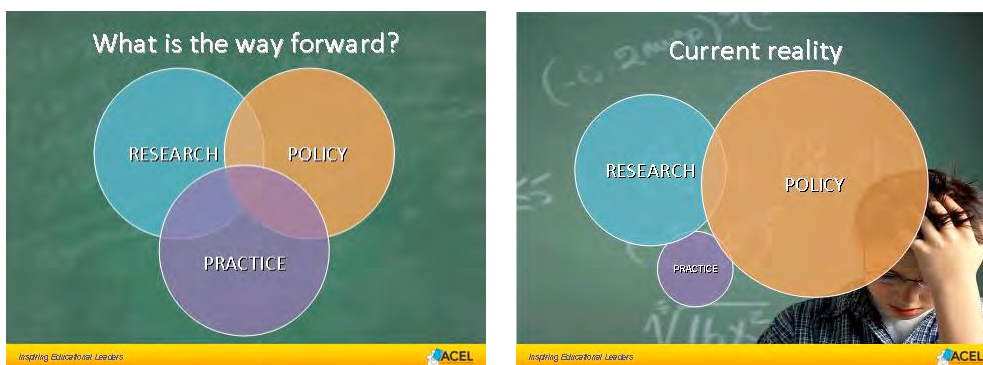
Well-constructed, well-coordinated, well-funded, and well-monitored strategies and programs focussed on the whole of Australia's schooling system offers the only viable opportunity to elevate primary industries in community consciousness to the level needed for them to meet the food and fibre security challenges that Australia will face into the future.

Britain may well be showing the way. In comparison to Australia's 15% of students who would be interested in working in agriculture, 25% of students from the British survey indicated they would be interested in working in farming. This may be the result of the FACE UK program which has been operating in Britain for 10 years.

The Foundation has formed strong links with FACE and we are exchanging learnings and experiences. One strategy that FACE successfully employs is a trained network of industry champions who act to showcase the industry at the local level. This network would be a useful conduit for school students, vocational trainees and tertiary students alike to receive mentoring, work placements and more readily engage the industry with the future workforce.

4.3.2 It's practice in the classrooms that makes the difference

As highlighted by Dr Jim Watterson, President of the Australian Council of Educational Leaders in his address at the ACEL Conference 2011^{xi}, it's not more 'policies' or 'research' that are needed, but more 'practice' to raise educational standards in Australia.



Theory into practice requires face-to-face education in conjunction with easily accessed resources (Joyce and Showers 1995)^{xii}. This study showed that an 85% uptake rate occurs when both are combined compared with just the resource alone at 5%.

4.4 THE IMPACTS OF ANY SHORTAGE ON AGRICULTURAL RESEARCH

The Foundation is not in a position to advise on this question.

4.5 THE ECONOMIC IMPACTS OF LABOUR SHORTAGES ON AUSTRALIA'S EXPORT ORIENTED AGRICULTURAL INDUSTRIES

The Foundation is not in a position to advise on this question.

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4.6 THE INCORPORATION OF ANIMAL WELFARE PRINCIPLES IN AGRICULTURE EDUCATION

4.6.1 The Foundation supports the incorporation of animal welfare principles in agricultural education.

There is a very strong association between animals and primary industries in the minds of students and the community at large, and 'care/love for animals' is a very high motivator for students in choosing primary industries careers.

Ensuring that there are zero failures in meeting our community responsibilities is therefore a critical pre-condition for primary industries to become 'a proud career choice'.

It should be noted that animal welfare is a generic discipline and misses out on industry wide support. It therefore suffers from a lack of profile or attention by most professionals in the industry and even within the primary industries education sector.

4.7 OTHER RELATED MATTERS

The Foundation wishes to highlight that the ACER survey is the first that the Foundation has commissioned and, like any good survey, not only does it shed light on many critical issues but also raises many more questions. While the Foundation is keen to apply its resources to 'practice' rather than more 'research' or more 'policy', it believes a priority for further research should be for the development and testing of more effective primary industries practice tools and programs.

The Foundation remains keen to further assist the Committee in any way it may require.



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