

Forestry education in Australia

The challenges of change

Ian Ferguson

This article provides a brief history of the principal Australian institutions involved in forestry education. It then reviews recent developments which are likely to reshape forestry education over the next decade and offers some conclusions. Much of the article is based on presentations at the Institute of Foresters of Australia Conference in Canberra in April 2013.

A brief history

The School of Forestry in Creswick was established in 1910 as an in-service school of the Forests Commission, Victoria for training in a three-year course to serve in the parent organisation. Most graduates proceeded to the University of Melbourne after some field experience and completed a Bachelor of Science in Forestry degree involving two further years of study. In 1981 the Creswick School was integrated and merged with the University of Melbourne School and course, offering a four-year Bachelor of Forest Science degree and postgraduate research degrees.

The Australian Forestry School was established in Canberra in 1926, under the Commonwealth Department of National Development. Students undertaking the first two years of an appropriately designed science course at their state university proceeded to the Australian Forestry School at Canberra to undertake a diploma course over two years. The home university granted a Bachelor of Science in Forestry degree.

However, Victoria withdrew from the arrangement in 1930 and instead continued to support the Creswick School, starting a division within the recently formed Institute of Foresters of Australia which took many years to heal. In 1965 the responsibilities of the Australian Forestry School were transferred to the Australian National University in Canberra, which developed a four-year Bachelor of Science in Forestry degree and postgraduate research degrees.

Sweeping changes

In a round of sweeping changes in the mid-1990s, the three year degree-granting Colleges of Advanced Education which had multiplied over the years under a separate funding system were allowed to become universities, to merge with them, or to be absorbed by them. Associated courses to forestry evolved in park management, environmental science and environmental management. Southern Cross University was established at Lismore, New South Wales and now offers a professional four-year course leading to a Bachelor of Forest Science and Management degree.

At the same time the long-established universities broadened first degree education by encouraging the development of combined double degrees. The time taken to complete them was, in aggregate, one year less than the sum of the normal durations. Both the Australian National University and the University of Melbourne have pursued this path. At its peak nearly 50 per cent of students at Melbourne were undertaking combined degrees, although substantially less than that proportion was in forestry.

No longer four years

The previously conventional professional four-year degree programme is no longer the norm in Australian universities or forestry schools. The Australian National University changed to a three-year Bachelor of Science (Forest Sciences) in 2011. The University of Melbourne in 2004 and the University of Western Australia in 2011 moved to adopt the so-called Melbourne Model. In this model all professional programmes involve postgraduate qualifications, and the first degree programmes have become three years in duration and are restricted to six or so major disciplines.

In 2012 the recently established University of the Sunshine Coast, located 90 kilometres south of Brisbane, established an Australian Forest Operations Research Alliance with Australian forest industry stakeholders. This was to continue the collaborative forest supply chain research established by the Co-operative Research Centre for Forestry. It will also offer courses in Forest Operations Management and associated postgraduate research training.

Challenges of the future

Course content

The recent Institute of Foresters of Australia forum on forestry education for practising foresters involved two panellists from universities – Professors Mark Brown, Sunshine Coast and Jerry Vanclay, Southern Cross, and two from major employers – Bill Jackson, Parks Victoria and Nick Roberts, Forestry Corporation, New South Wales. The forum enjoyed a wide range of input from the audience which included the heads of the Australian National University and University of Melbourne forestry units or departments. The audience was spread reasonably evenly across academic and research, government, industrial and corporate forestry, ecosystem services, and private consulting employment.

There was general acceptance that the Institute of Foresters of Australia and forestry education in general ought to set its sights broadly, given the diverse range

of employment now evident in forestry. Bill Jackson, CEO of Parks Victoria, put it well when he pointed to the existence of many forestry graduates among his staff and the fact that many of the areas of knowledge and skills needed are common to those of other forestry organisations. This is despite public perceptions of marked differences, such as those concerning industrial forestry and national park management.

The panellists collectively identified silviculture, forest inventory and planning, forestry business economics and forestry operation management as the critical common components of any course, with the necessary implied underpinning in the relevant basic biological, economic, mathematical and social sciences. All stressed the importance of practical experience and communication, in the formal courses and in vacation or part-time work.

There was general agreement among panellists and audience that the multi-skilled training in forestry courses, together with practical and work experience, produced people capable of rising to the challenges they had to face in the field. However, there was some concern that the mentoring of young graduates was no longer possible to the same degree as in the past. The importance of attuning future graduates, often largely from urban backgrounds, to rural life was also mentioned. In short, there were no great surprises about curriculum content – the focus was on changes to adapt to new technologies and priorities.

Cost-competitiveness

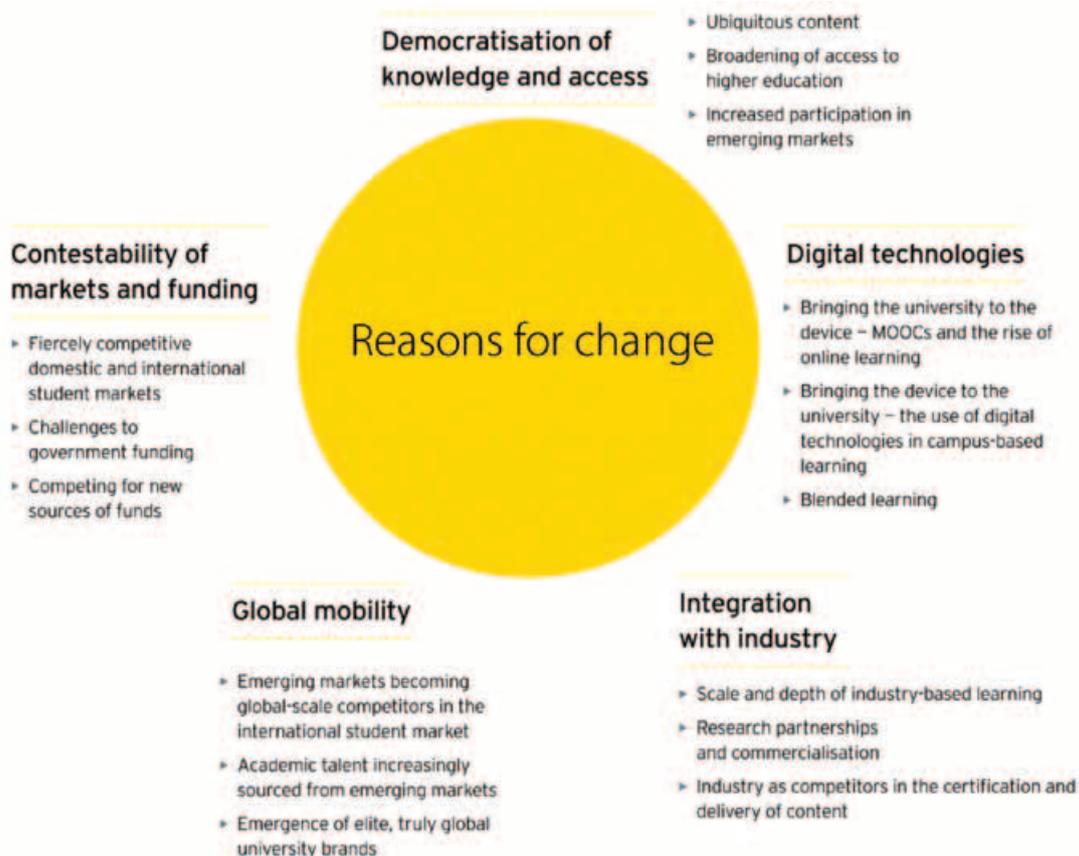
Therefore, the elephant in the room was not the design and content of courses, it was the economics of mounting such courses with minimal numbers of students. As Jerry Vanclay pointed out, sending students to undertake a particular subject at a better-placed institution does not aid survival when numbers are precariously low, as seems the case with all forestry courses in Australia.

Low student numbers are not confined to forestry. Agriculture is suffering similarly and those in environmental science and management courses have plateaued and may be dropping. The high exchange rate is not helping the recruitment of overseas postgraduate students which might otherwise compensate in part for these problems.

Collaborative arrangements may appear a sensible way of managing across the increased number of providers of forestry courses, but they are dogged by difficulties that the funding system imposes in effecting transfers of student numbers or cash. There is a formal collaborative network, but it is operating on a shoestring budget for one further year and will, at best, only be able to help in improving the teaching of three subjects. New models for collaboration are desperately needed.

Reasons for change

The challenges are not confined to forestry and related schools in the Australian universities. Ernst



& Young recently undertook an independent study involving interviews with senior staff in 20 universities across Australia and which included interviews with 16 Vice-Chancellors. Ernst & Young identified the key reasons for change for Australian universities and these are summarised in the diagram.

For those employed in university education, there are no great surprises in the nature of causes of change. However, if the reported responses of senior university staff and vice-chancellors cited below are any indication, the pace and challenges of change will increase markedly.

Teaching methods have to change. We cannot rely on delivering content anymore – it is all about contextualisation, ways of thinking, and the student experience. *University Provost*

We will come under increased pressure on government funding, whichever way you look at it. *Head of university representative group*

Our major competitor in 10 years' time will be Google – if we are still alive! *University Vice-Chancellor*

There will be 15 to 20 independent global brands – the rest will be playing for the silver medal. *University Vice-President*

The big game will be co-investment with the private sector. *Head of university representative group*

The traditional university model is the analogue of the print newspaper –15 years max, you've got the transformation. *University Vice-Chancellor*

Universities face their biggest challenge in 800 years. *University Vice-Chancellor*

The big change will be partnerships with industry around niche. *University Vice-Chancellor*

Ernst & Young concluded that –

- Over the next 10 to 15 years, the current public university model in Australia will prove unviable in all but a few cases.
- The drive towards this model will come from the challenge of staying competitive in domestic and international markets across a broad range of disciplines and segments.
- Nevertheless, research will become increasingly concentrated in universities which can demonstrate excellence and impact.
- Smaller universities will become increasingly focused on a narrow range of research programmes. To make this work, they will need to explicitly tie education programmes and industry partnerships to these focused programmes.

The Ernst & Young perspective on the relationship between the higher education sector and industry raises some additional concerns. They argue that industry will

not only be a customer and partner of higher education institutions, but increasingly a competitor.

On one hand, research commercialisation will become a source of core funding for many university research programmes. On the other, industry will increasingly compete with universities in the supply of specialist professional programmes, mainly via specialised postgraduate programmes offered through similar professional associations.

Given the relatively small size of the forest products sector and smaller size and fragmentation of professional associations involved, any progress on either front in forestry would need encouragement and financial assistance from government in some form. However, it does suggest that the two institutes should take a more active role in organising and promoting continuing professional development.

Adapt or perish

The forum audience seemed somewhat sceptical of the pressures that cost-competitiveness might pose. However, they may have changed their view somewhat in the light of the announcement that Australian universities will be subject to a two per cent productivity improvement reduction in funding next year and a further 1.25 per cent in 2015. This is in addition to some other reductions that will affect student enrolments.

These changes reflect the government's belief that new technologies offer a counter to the rising real costs of university training. They will mean that universities have to reduce their costs from new technologies in teaching and reductions in back-office employment.

Because annual student fees and government funding per student are essentially constant across the three or four years of a course, the subjects in first year with high enrolments cross-subsidise the teaching of subjects with smaller enrolments in later years. The effect of these changes in teaching technology will fall first and foremost on the first-year subjects with large student enrolments where online teaching can be more quickly developed.

Over 100 subjects already exist in the Coursera scheme, a collaborative across 100 universities globally. In addition are those of the Ivy League and other universities on iTunesU, the Massive Open Online Courses group and the privately-funded but large commercial endeavour by Udacity in the United States.

Students in all subjects are already walking with their fingers and most universities in Australia are reporting declining attendance at lectures. As Cris Brack of the Australian National University said at the forum, much of the change in forestry subjects will come from blended teaching involving greater use of online teaching, but retaining face-to-face tutorials and practical teaching.

The trick will be to convince the university that supporting the investment needed for the development

of online modes of teaching will provide a reduction in long-term costs, as well as maintaining or improving quality, especially in the less popular subjects which have smaller enrolments. Some universities already have a minimum enrolment of 15 and similar constraints may become the norm in Commonwealth funding of courses.

Pace of change

In the longer term, the changes will spread to other subjects at a pace which depends on the capacity of staff to adapt to and develop online teaching and the nature of the subject matter. The effect across universities in general will not be easy as 25 per cent of the academic workforce is aged over 55 years, compared to 15 per cent in the rest of the population (Ernst & Young, 2012).

Significant proportions of the academic workforce will retire over the next decade. Forestry schools with a predominance of younger staff will find it easier to adapt because younger staff tend to be more technology-savvy. Cost-competitiveness is inescapable. No-one can predict exactly how the changes will unravel and which universities, and schools within them, will survive.

At the forum, Kevin Harding urged industrial forestry companies and other major employers to provide scholarships of \$20,000 a year to encourage students to take up forestry. My response, perhaps reflecting employer views, is that \$60,000 is too much and too risky an investment, given that it is difficult to bind the recipient to employment to get your money back via their work.

Why spend \$60,000 when you can import foresters or forestry professionals, often with field experience, for a fraction of that amount. This is witnessed by the imports over the last two decades from New Zealand, South Africa, Latin America, China and India. The market place is now global – cost-competitiveness rules.

Conclusions

In my view all four-year professional courses in Australia will probably be required to reduce to three-year programmes, whether willingly or unwillingly. Most universities are likely to introduce combined double degrees involving one professional course or move to a form similar to the Melbourne Model.

This means that a total of five years may become the general minimum for professional forestry degrees. The growth in knowledge and technology underpinning later year subjects has generally outstripped the

limitations of a four-year professional course and, much more so, a three-year course. This development will exacerbate the funding issues.

The preceding review ignores the numbers of postgraduate research students undertaking forestry research at forestry schools and other universities. These represent a significant additional supply of forestry professionals in specialised areas. It also ignores the smaller, but nevertheless significant, numbers of students undertaking first degrees in kindred areas such as environmental science and management and natural resource management who obtain employment in forestry organisations.

Regrettably, the statistical data available does not enable a reliable estimate of these, or of the numbers of students and staff in the forestry schools. Suffice it to say that most would regard the numbers of students as being barely sufficient to maintain viability.

My own predilection is to urge the two institutes not to try to pick winners, but rather to be inclusive and supportive to ensure young graduates and recruits get the best possible grounding in forestry for the field, laboratory and office positions they are going to assume. Importantly, they should also provide for continuing professional development, a largely neglected but increasingly significant aspect of teaching and innovation in the professions.

The institutes only have a very limited leverage in the public debate. However they can, and should, indicate to universities interested in training foresters or forest scientists the knowledge and skills that they ought to ensure are taught or made available to students.

Many forestry professionals will feel uneasy, if not depressed, by the challenges of change. Survival of the fittest is not a comforting model for institutions with which one has an important and often long affiliation. However, the next decade is a critical one for forestry schools to adapt or perish.

I prefer to view the present situation as that of a glass half full, with many opportunities for those forestry schools that can rise to the challenges. I hope that the Institute of Foresters of Australia and the New Zealand Institute of Forestry can do likewise.

References

Ernst & Young. 2012. *Universities of the Future*. Ernst & Young, Australia. Available at www.ey.com.au

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