



Australian Government

**OPENING ADDRESS TO THE NATIONAL FORUM
ON EDUCATION IN THE BIOMEDICAL
SCIENCES**

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Australia's Chief Scientist

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9:00am, Monday 12 December 2011

Thank you for inviting me to open the National Forum on Education in the Biomedical Sciences.

There is no doubt that the teaching of science courses is a critical element in our future – especially if we want that future to be safe, secure and sustainably prosperous.

And we don't start from a particularly rosy position – although the biomedical sciences are in better shape than most and there has been a slight increase in science enrolments in recent years.

For the purpose of the figures I am about to give you, *Biomedical Sciences* are defined as: biochemistry, cell biology, genetics, microbiology, human biology, medical science and pharmacology.

If you allow that definition, then in 2009, those biomedical sciences accounted for 28% of all science teaching to domestic undergraduates enrolled in a science degree – that is, load per BSc. This is about double the amount of teaching of maths or chemistry to science students.

For 2nd and 3rd year students, the biomedical sciences accounted for 35% of all science teaching to domestic undergraduates enrolled in a science degree in 2009. This is around three times the amount of teaching of maths or chemistry to those students. I should add that other biology takes the 'biological sciences' figure up to about 60% of the total.

As I said, the biomedical area is in a better position than physics, chemistry and mathematics.

But, personally, I would find it hard to argue that we can have robust biomedical sciences alongside weak or weakening physics, chemistry, mathematics and statistics. Biomedical sciences without the foundation that those disciplines offer would be pretty flimsy.

But that isn't the end of it.

In our schools, there has been a fall in participation in science subjects in year 12 that should alarm us all. Some work done for us by the AAS shows that between 1991 and 2007, Biology enrolments are down from 36% to 25% of students enrolled in year 12; Chemistry from 23% to 18% and Physics from 21% to 15%.

While the decline appears to have slowed, there is no sign yet that it has stopped.

As Chief Scientist - even as a former VC – I don't think that the signals that these numbers send are good for our country. As a once practising scientist, I can't imagine how we did then, and apparently how we still, miss the opportunity to explain the awesome wonder indeed the beauty of science to our students – let alone the importance of science to our future.

But, if you look at the responses from students to surveys, you find that they too many too often declare that science is hard, boring or presented in a not very interesting way.

Didactic approaches riddled with formulae and content that is disconnected from what the students see and hear around them in every day life. And this approach is compounded by a recipe-based approach to practicals that are right or wrong not imaginative ones that stimulate thinking.

It would appear that too many students are taking the content given to them and trying to remember enough to pass. And for many in school they drop it when they can; and for many in university they take some science in first year because they need it and then stop it when they can – first year science enrolments are some 50-70% of total science enrolments.

- Surely in our schools and universities it is time to consider how we interest our students in ways that kindle a flame.

We know from our Australian Learning and Teaching Council's work that there are a lot of good ideas out there – the question for us – for you – is how to learn from them, how to harness them and to provide a science education in our schools and universities that interests students in science and ensure that it is an interest that grows rather than dampened by the way we go about offering science to our students.

It is not all straightforward. Our intake is not homogeneous. The growth in our sector has meant that there are many students enrolled in science programs from the ATAR of 100 to something much, much lower. Accommodating the breadth is not easy: setting the bar too high simply means that there are many disillusioned who will probably fail or drop out; setting it too low is not in our interests – we need to stimulate and challenge all students including our best.

This sorts itself out to some extent: our universities are not an homogeneous set either. Different universities will cater for different parts of the cohort and aim for different outcomes. We know they do.

And we can predict that the outcomes are different: the highest percentage increase in science enrolments over the past two years (off a low base) was in a university with an ERA score of 2; 6 of the Go8 contributed collectively some 45% of additional science enrolments with an average ERA of 4.2. I expect the students are taught in a different environment.

But it also means that we have to work hard and probably differently to ensure that all our students are well prepared for their university studies AND then receive what they are entitled to expect: that if a university enrols them in a program, they are entitled to expect that with diligent application they have a fair chance of succeeding.

The question is how?

The issue that I know confronts you, that interests you, is an important one: how do we learn from each other and advance the cause - we know that in contemporary times, by working as individuals or in small groups it is just not going to work. Active and strategic collaboration is needed.

This forum has all the right foundations and the right motivation.

It has been initiated by the Academy and the network (CUBEnet) has been funded by the Australian Learning and Teaching Council and has the support of the Australian Deans of Science. The main aim of the network is to identify and address the key issues and challenges facing biomedical science educators in the 21st century and in the process to:

- develop a leadership group of active tertiary biomedical academics at the national level to create a program-wide approach to the biomedical curriculum
- maximize the efficiency of development, dissemination and adoption of innovative curriculum elements

- aggregate, filter and connect ideas and information with the other teams and networks to achieve effective, transferable and sustainable solutions.

I think it is what needs to be done – and I commend your initiative.

I do think it is important that we come to terms with the reality of today. We need more science, more people with a science – based education, more people comfortable with science and more people prepared to help lead the community through the scientific complexities of the modern world.

If we do that, we will have done well by our students, by our country and by our world. I am happy to declare the forum open.

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