Submission No 18

INQUIRY INTO THE RECRUITMENT AND TRAINING OF TEACHERS

Organisation: University of New South Wales

Name: Professor Michael Cowling

Position: Head of the School of Mathematics

Telephone:

Date Received: 22/02/2005

Theme:

Summary

THE UNIVERSITY OF NEW SOUTH WALES

SCIENTIA PROFESSOR
MICHAEL COWLING
HEAD
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21 February 2005

The Honorable Jan Burnswoods MLC
Chair
Standing Committee on Social Issues
Legislative Council
Parliament House
Macquarie Street
Sydney NSW 2000

Dear Ms Burnswoods,

Re: Inquiry into the Recruitment and Training of Teachers

I am writing as Head of the School of Mathematics at the University of New South Wales, and also as President of the Australian Mathematical Society. I have some experience with mathematics in schools in the State of New South Wales, having been on the HSC Mathematics Examination Committee for five years (as chair for four years), and in that role having addressed many meetings of high school mathematics teachers. I have also assisted the Board of Studies on a number of other occasions in matters relating to mathematics, and been a member of the Mathematical Association of New South Wales, a professional body of school mathematics teachers (and hence of the Australian Association of Mathematics Teachers), for over ten years.

This submission is about the training of mathematics teachers in schools. I draw to your attention a British study on whether particular subjects taken by school students had any effect on their lives, and which reported "one major and striking exception". Most subjects had little effect, but in mathematics, the exceptional subject, people who had attained A-level were found to be earning 10% more than those who had not studied mathematics to this level, irrespective of their careers (see pages 34 and 35 of *Does education matter?* by Alison Wolf, Penguin, 2002). This study shows that the importance of mathematics to students' participation in society and to the long-term creation of wealth for the benefit of all cannot be underestimated, and should clearly be of concern to a committee on social issues.

In our mathematically and technologically based world, students need more mathematics, not less, and this has significant implications for teacher training. I also draw to your attention the recent Federal Review of Teaching and Teacher Education and some of the disturbing findings revealed in that report. I am particularly concerned by the small percentage of teacher graduates (only 7% of the total yearly cohorts) who are adequately qualified to teach mathematics, and that the amount of time spent on mathematics content by primary teachers trainees appears to be decreasing. In the State of New South Wales, the problem of decreasing mathematical training in the formal degree programs for prospective teachers has been compounded by the creation of short courses for teachers with very little mathematical training to turn them into mathematics teachers. My high school contacts tell me regularly that many school mathematics teachers, especially those who have taken short cuts into the profession, feel the need for further professional training.

Traditionally, universities in New South Wales (and elsewhere) provided additional training for high school mathematics teachers through higher degrees such as the Master of Arts at Sydney University and the Master of Mathematics at the University of New South Wales.

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However, since the Department of Education has given priority to degrees such as the Master of Educational

Administration, high school principals have ceased to encourage their teachers to strengthen their discipline knowledge base. "The system" no longer has functioning mechanisms for teachers to consolidate and update their discipline knowledge.

I would also like to draw your attention to the report of the independent inquiry into Post-14 Mathematics Education in the UK chaired by Professor Adrian Smith, "Making Mathematics Count." It contains a number of comments, as well as recommendations, that are directly relevant to the NSW experience. For example, the report notes that

> The shortage of specialist mathematics teachers teaching mathematics is the most serious problem we face in ensuring the future supply of sufficient young people with appropriate mathematical skills.

The report is available on the web, at www.dfes.gov.uk/mathsinquiry/

Referring specifically to your terms of reference, I list two key points:

Item 2: career change teachers can make excellent mathematics teachers, but many need more mathematical training.

Item 4: accelerated training courses in mathematics do not provide all who take them with the assurance and confidence needed to be able to teach high-level courses, such as HSC Mathematics.

I would welcome the opportunity to discuss these points in person with the Committee on Social Issues. I can also suggest ways in which the mathematics profession in Australia could assist in dealing with the problems. My university, like most universities in Australia, is a member of the Australian Mathematical Sciences Institute (AMSI), which administers the International Centre of Excellence for Education in Mathematics (ICE-EM), a body with over seven million dollars of federal funding to promote education in mathematics. For more information, see `www.amsi.org.au` and `www.ice-em.org.au`. AMSI/ICE-EM has already begun several projects that are relevant to the inquiry at hand. One of these is to use materials produced in the USA to document the mathematical content that Australian teachers need to know to prepare students for now and in the future. This aims to become the expectation for graduating teachers and provide a framework for re-training and professional development courses. AMSI/ICE-EM is also developing courses targeted at teachers teaching out of field. There is a considerable pool of these people who could be meeting the need for more mathematics, science and IT teachers. A consortium including The Association of Professional Engineers, Scientists and Managers Australia, AMSI, Engineers Australia, the Australian Computer Society and the Australian Institute for Mining and Metallurgy has been meeting for some time about this issue, and has already formulated a proposal which addresses many of the needs which are evident in this state.

If I am given this opportunity, I can speak for my own School of Mathematics and (to some extent) for other university mathematicians in this state. I would hope that a representative of AMSI/ICE-EM, who can speak more authoritatively than I on ways in which AMSI/ICE-EM funding can be used to promote education in mathematics, might accompany me.

Yours sincerely,

Michael Cowling

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mathematical training to turn them into mathematics teachers. My high school contacts tell me regularly that many school mathematics teachers, especially those who have taken short cuts into the profession, feel the need for further professional training.

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