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Response for House of Representatives Standing Committee on Education and Training

Question 1

Evidence provided by the Australian Council of Deans of Science showed that 1 in 12 mathematics teachers studied no mathematics at university level and one in five studied no mathematics beyond first year.

- What strategies are in place to recruit graduates from science-related fields into teaching and teacher training?

Response

The Government is supporting school mathematics education by providing financial incentives for those studying maths, science and statistics units and students taking up relevant science occupations, including teaching science through the HECS-HELP scheme.

From 1 January 2009 the maximum annual student contribution amount (previously called HECS) for commencing Commonwealth supported students studying mathematics, statistics and science units of study was reduced by \$3250 from \$7412 to the lowest 'national priority' rate of \$4162 (2009 rates, indexed in future years). The lower contribution applies to new students (and some continuing students who transfer to a course of study in the natural and physical sciences from one that is in another field). Current students (other than the transferring students) will continue under existing arrangements.

From the 2008–09 income year, eligible mathematics and science graduates (who graduate from second semester 2008 onwards) will be able to apply for a HECS-HELP benefit if they take up related occupations including teaching these subjects in secondary school and primary school teaching. This will reduce their compulsory HELP repayment by up to \$1500 a year (around half on average) for up to five years.

The new Smarter Schools Quality Teaching National Partnership between the Commonwealth and the states and territories focuses on reforms to attract, train, place, develop and retain quality teachers and school leaders in our classrooms and schools to help address shortages in key teaching areas like mathematics.

The NP includes initiatives that will result in a minimum of 450 new teachers entering schools. The initiatives include *New Pathways into Teaching*, to help the profession attract top university graduates, including maths graduates, and *Better Pathways into Teaching*, for 'mid-career changers' who have gained valuable skills and experience through existing careers

Question 3

What action, if any, has been taken in response to the findings of the *TIMSS 07: Taking a closer look at mathematics and science in Australia* study which was released in December?

Response

The Government has committed to the development of a national curriculum from kindergarten to Year 12, starting with the key learning areas of English, mathematics, the sciences and history.

Australian Government support is being provided through a number of measures to improve the quality of science and mathematics teaching and learning in schools, and to support the delivery of national curriculum, as part of the Education Revolution:

- The *Scientists in Schools* project involves scientists establishing ongoing partnerships with primary and secondary schools to add real world relevance to science education
- The *Science by Doing* project, led by the Australian Academy of Science, is developing a new approach to science teaching and learning for the junior secondary years emphasising student investigations, inquiry-based learning and scientific thinking and
- The *Primary Connections* program, also led by the Australian Academy of Science, is developing curriculum units and professional learning programs for teachers aimed at improving primary students' knowledge of science while also focussing on the development of their literacy skills.
- The *Smarter Schools Quality Teaching National Partnership* between the Commonwealth and the states and territories is underpinning reforms to attract, train, place, develop and retain quality teachers and school leaders in school classrooms and help address shortages in key teaching areas. The Government is providing funding of \$550m to support those jurisdictions that address key priorities in teacher recruitment, training, management and professional development through:
 - ~ Facilitation Reforms, including improving the quality and availability of teacher workforce data.
 - ~ Related Reward Reforms, including improved pay dispersion to reward quality teaching and improved reward structures and in-school support for teachers and leaders who work in disadvantaged Indigenous, rural/remote and hard-to-staff schools.
- Provision of \$1 billion as a long term investment for *Science and Language Centres for 21st Century Secondary Schools* to build around 500 new science laboratories and language learning centres in schools with a demonstrated need, readiness, and capacity to complete construction by 30 June 2010.

Question 4

What mechanisms are in place to identify existing teachers in maths and science who may require further professional development?

Response

The Australian Government Quality Teacher Program (AGQTP) was established in 2000 to raise the quality, professionalism and status of Australian teachers and school leaders. The program has seen over 240,000 teachers and school leaders participate in professional development opportunities. There are three main objectives for the AGQTP's 2005-2009 phase, these are to:

1. equip teachers with the skills and knowledge needed for teaching in the 21st Century
2. provide national leadership in high priority areas of teacher professional learning and

3. improve the professional standing of school teachers and leaders.

State and territory teacher professional learning projects

Through funding agreements with State and territory government and non-government education authorities AGQTP provides funding for professional learning activities for teachers. Activities must address one or more of the specified priority areas which includes maths and science. These priority areas may be adjusted as required. The current AGQTP priority areas are:

Curriculum priority area

- literacy/English
- numeracy/maths
- science (including environmental education for sustainability)
- civics and citizenship
- information and communications technology (ICT)
- health education
- languages
- vocational education and training
- music

Targeted learning needs

- boys
- Indigenous students
- gifted and talented students
- students with disabilities and learning difficulties
- ESL students

Cross-curricular/whole school

- general pedagogy
- whole-school innovative teaching approaches
- professional standards and leadership
- National Safe Schools Framework
- student reporting
- the innovative use of ICT across the curriculum
- values education
- studies of Asia
- consumer and financial literacy education

In addition, there will be a focus in the new Smarter Schools - Quality Teaching National Partnership on developing and enhancing the skills and knowledge of teachers and school leaders throughout their careers, with an emphasis on national curriculum areas, that includes maths and science.

Question 5

The Committee received evidence (see, for example, Submission no. 2, p. 2, and *Transcript of Evidence*, 14 November 2008, p. 70) which argued that figures such as those in DEEWR's submission were 'misleading' and 'sit poorly with the known problems in university physics departments'. Professor John Rice from the Australian Council of Deans of Science, for example, stated that if you look at the population of students studying science in proportion to the overall student population, physics has gone down in proportion by a third and chemistry and maths by about a half.

- Does the Department have updated enrolment figures to those presented in its original submission in June 2008?

Response

Domestic enrolments, undergraduate and postgraduate, in the enabling sciences for the period 2001-2007, including latest available data, are shown below.

Domestic enrolments, undergraduate and postgraduate, in the enabling sciences, as a proportion of total enrolments, are also shown.

Domestic undergraduate enrolments in enabling sciences declined by 2.2 per cent between 2006 and 2007, while domestic undergraduate enrolments in the broad field of natural and physical sciences increased by 0.7 per cent.

Domestic postgraduate enrolments in the enabling sciences increased by 3.6 per cent between 2006 and 2007 and domestic postgraduate enrolments in the broad field of natural and physical sciences increased by 3.8 per cent.

Note that a majority of enrolments in the broad field of natural and physical sciences (over 70 per cent of domestic undergraduate science enrolments in 2007) are not coded to any particular narrow field. This could reflect the structure of many university science courses where study of different narrow fields is incorporated within broad level science courses. Therefore enrolment statistics for the natural and physical sciences should be interpreted with caution as they may understate the numbers of students actually studying the enabling sciences.

Enabling Science Enrolments

Domestic Undergraduate	2001	2002	2003	2004	2005	2006	2007	Change 01-07	Change 06-07
0101 Mathematical Sciences	2,215	2,347	2,316	2,393	2,282	2,177	2,024	-8.6%	-7.0%
0103 Physics and Astronomy	784	880	937	989	957	898	796	1.5%	-11.4%
0105 Chemical Sciences	1,209	1,143	1,214	1,558	1,143	1,145	1,142	-5.5%	-0.3%
0109 Biological Sciences	10,198	11,011	11,133	11,512	10,952	10,839	10,761	5.5%	-0.7%
Total Enabling Sciences	14,406	15,381	15,600	16,452	15,334	15,059	14,723	2.2%	-2.2%
Total Natural and Physical Sciences ^(a)	51,826	52,476	53,311	54,500	53,951	53,939	54,313	4.8%	0.7%

^(a) The data takes into account of Combined Courses to two field of education. As a consequence, counting both fields of education for Combined Courses means that the totals may be less than the sum of narrow fields of education.

Domestic Postgraduate	2001	2002	2003	2004	2005	2006	2007	Change 01-07	Change 06-07
0101 Mathematical Sciences	749	907	919	1,011	959	1,005	1,111	48.3%	10.5%
0103 Physics and Astronomy	833	894	957	1,039	1,010	1,042	1,040	24.8%	-0.2%
0105 Chemical Sciences	1,016	868	888	910	871	933	922	-9.3%	-1.2%
0109 Biological Sciences	3,238	3,502	3,703	3,891	3,523	3,580	3,723	15.0%	4.0%
Total Enabling Sciences	5,836	6,171	6,467	6,851	6,363	6,560	6,796	16.4%	3.6%
Total Natural and Physical Sciences ^(a)	8,361	9,014	9,503	10,020	10,094	10,444	10,846	29.7%	3.8%

^(a) The data takes into account of Combined Courses to two field of education. As a consequence, counting both fields of education for Combined Courses means that the totals may be less than the sum of narrow fields of education.

Enabling Science Enrolments as a Proportion of Total Enrolments

Domestic Undergraduate	2001	2002	2003	2004	2005	2006	2007	% Point change 01-07 ^(a)	% Point change 06-07 ^(a)
0101 Mathematical Sciences	0.43%	0.44%	0.44%	0.46%	0.43%	0.40%	0.36%	-0.06%	-0.04%
0103 Physics and Astronomy	0.15%	0.17%	0.18%	0.19%	0.18%	0.17%	0.14%	-0.01%	-0.02%
0105 Chemical Sciences	0.23%	0.22%	0.23%	0.30%	0.22%	0.21%	0.20%	-0.03%	-0.01%
0109 Biological Sciences	1.96%	2.07%	2.10%	2.19%	2.07%	2.01%	1.93%	-0.03%	-0.08%
Total Enabling Sciences	2.77%	2.89%	2.95%	3.13%	2.90%	2.79%	2.64%	-0.13%	-0.15%
Total Natural and Physical Sciences	9.96%	9.87%	10.07%	10.37%	10.20%	9.99%	9.73%	-0.23%	-0.26%
Total Domestic Undergraduate	520,221	531,527	529,403	525,505	528,980	539,849	557,985	7.3%	3.4%

^(a) Last row measures % change not % point change.

Domestic Postgraduate	2001	2002	2003	2004	2005	2006	2007	% Point change 01-07 ^(a)	% Point change 06-07 ^(a)
0101 Mathematical Sciences	0.51%	0.57%	0.54%	0.58%	0.55%	0.57%	0.61%	0.10%	0.04%
0103 Physics and Astronomy	0.57%	0.56%	0.56%	0.60%	0.58%	0.59%	0.57%	0.01%	-0.02%
0105 Chemical Sciences	0.69%	0.54%	0.52%	0.53%	0.50%	0.53%	0.51%	-0.18%	-0.02%
0109 Biological Sciences	2.20%	2.19%	2.17%	2.25%	2.03%	2.02%	2.05%	-0.15%	0.03%
Total Enabling Sciences	3.97%	3.85%	3.79%	3.96%	3.67%	3.70%	3.74%	-0.23%	0.04%
Total Natural and Physical Sciences	5.69%	5.63%	5.58%	5.79%	5.83%	5.89%	5.97%	0.29%	0.08%
Total Domestic Postgraduate	147,035	160,165	170,438	173,159	173,273	177,229	181,561	23.5%	2.4%

^(a) Last row measures % change not % point change.

Questions on Notice taken at the wrap-up hearing of Thursday 5 February 2009

Question asked by Ms. Bird

REGISTRATION AND QUALITY CONTROL OF COURSES FOR OVERSEAS STUDENTS

Question 1

"When you say it is operationalised through the states, basically that means they can set up an accreditation system and we accept the accreditation system as legitimate, so, if you pass that, you can go on the federal register. What about quality control? Do we intervene in that? Do we do site visits on these providers?"

Response

The Education Services for Overseas Students (ESOS) legislative framework builds on the quality assurance arrangements of each state and territory for the different education sectors. These arrangements are largely in line with nationally agreed frameworks but must also correspond with the legislation of each jurisdiction.

Providers wishing to enroll international students must be registered on the Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS), which is administered by DEEWR. Registration requirements are set out in section 9 of the ESOS Act.

Under the ESOS legislative framework, the federal, state and territory governments share responsibility for monitoring providers who offer courses to international students. DEEWR and designated authorities both carry out site and other audits of providers to ensure compliance with the Standards of the National Code 2007.

ISSUES AFFECTING MATURE-AGE APPRENTICES

Question asked by Ms D'Ath

Question 2

Of the Support for Mid-Career recipients:

- how many were already in existing jobs and are upgrading their skills
- (of those upgrading their skills) how many were unemployed?

Response

As at 22 February 2009 there are 10 989 Support for Mid-Career recipients since the start of the initiative on 1 July 2007. Of the 10 989 recipients, 3625 are existing workers upgrading their skills and 7364 recipients are new Australian Apprenticeships commencements but were not necessarily unemployed prior to commencing. The department does not collect this information at commencement of an Australian Apprenticeship. *Source: TYIMS Hyperion database (current as at 23/02/09).*