

Senate Committee: Education and Employment

**QUESTION ON NOTICE
Additional Estimates 2016 - 2017**

Outcome: Higher Education Research and International

Department of Education and Training Question No. SQ17-000187

Senator Carr, Kim provided in writing

Promoting STEM throughout secondary schools and universities

Question

What programs are currently operating within the Department that deal especially with STEM and its promotion throughout secondary schools and universities, including teacher development? Please provide a breakdown of each program, the responsible agency or branch/division of the Department, together with each programs outcomes in terms of student enrolments, student attainment levels etc (whatever the measured statistics may be)?

Answer

The Department of Education and Training is delivering a range of initiatives to encourage secondary and higher education students to study and pursue careers in fields of science, technology, engineering and mathematics (STEM). A number of these initiatives are part of the National Innovation and Science Agenda. Examples are included below.

Supporting more women in STEM careers – a national research internship program (NRIP)

The Government is providing \$28.2 million to support the Australian Mathematical Sciences Institute (AMSI) to expand its Intern program to national program that will deliver an additional 1400 PhD internships over four years commencing this year.

Australian Maths and Science Partnerships Program (AMSPP)

Approximately \$21.6 million has been provided to 22 projects over the period (2012–13 to 2015–16) which supported projects that increase teacher capacity, teaching quality and student participation in STEM, with the aim to encourage greater student interest in STEM through partnerships between universities and schools. Projects under this program are due to be completed by 30 June 2018. Final participation rates have not been quantified.

Australian Mathematical Sciences Institute (AMSI) – Vacation Schools Program

Under this program a grant of \$2 million over the period 2016 to 2020 has been provided to support AMSI's Securing Australia's Mathematical Workforce project which will deliver a range of secondary school and tertiary programs that encourage students to pursue study and careers in STEM by participating in vacation programs, workshops, and work integrated learning. Under the previous project delivered under this program from 2012 to 2016, a total of 1583 participants completed courses delivered by AMSI.

Higher Education Research Promotion (HERP) – Learned Academies and Australian and New Zealand Association for the Advancement of Science (ANZAAS)

Approximately \$4.8 million is provided annually under the Higher Education Research Promotion Program (HERP) to the Learned Academies to provide the Government and the Australian community with access to quality, independent advice informed by the latest research and scientific evidence on national and international matters and to ANZAAS to deliver 'Youth ANZAAS', an annual residential and international forum for science students in Years 10 to 12. Every year, students from each State and Territory are selected to participate in science activities and experiences over a period of a week. The HERP program is forecast to meet a target of 54,000 attendees participating in activities delivered by the Learned Academies and ANZAAS.

Enhancing the Training of Mathematics and Science Teachers

With \$12 million over three calendar years 2014 to 2016 this program is supporting five multi-institution consortia, involving 25 higher education institutions as well as research organisations and state governments. These five projects are scheduled to complete by mid-2017. Final outcomes for the five projects have not yet been quantified.

In response to the Teacher Education Ministerial Advisory Group recommendation, the Government has also implemented new schools accreditation standards that require all primary teaching students to graduate with a subject specialisation, with a focus on subject or curriculum areas which are in demand, including STEM subjects.

The University of Adelaide's Digital Technologies Massive Open Online Courses (NISA initiative)

The program aims to expand online learning programs to improve digital technologies training for teachers. This initiative supports implementation of the Australian Curriculum: Digital Technologies. There are currently over 7000 teachers enrolled across the three MOOCs and there are over 130,000 students undertaking digital technologies activities in the classroom.

Teacher Support for Digital Technologies (NISA initiative)

This initiative provides schools in disadvantaged areas with access to specialist ICT educators and support, in person or via telepresence. This will benefit 160 of our most disadvantaged schools (based on ICSEA score of under 900).

STEM Partnerships with Schools (NISA initiative)

This program continues operation of the program currently known as Scientists and Mathematicians in Schools.

It supports flexible partnerships between STEM professionals and schools to enable students and teachers in both primary and secondary schools understand how STEM is applied in the real world; introduce them to emerging STEM innovations and potential career paths; provide student mentoring opportunities; and better match industry expectations and aspirations. CSIRO delivers this program for the department and provides additional in-kind support in the form of program staff with relevant expertise in subject areas and program management. There are almost 2000 partnerships with schools.

Digital Literacy School Grants (NISA initiative)

The program consists of two rounds of competitive grants expected to fund approximately 100 projects which support innovative methods of implementing the Australian Curriculum: Digital Technologies. Applications for the first round closed in October 2016. There will be around 100 schools funded over two years.

ICT Summer Schools (digIT) (NISA initiative)

Delivered by the Australian Academy of Science, this project supports the development of secondary science teaching and learning resources, as well as professional learning resources to support teaching by inquiry. 240 disadvantaged secondary students with an interest in digital technologies will participate.

Mathematics by Inquiry

Delivered by the Australian Academy of Science, this project develops and disseminates a suite of resources incorporating contemporary mathematics pedagogies. Resources will be available free to all Australian students and teachers. Preliminary projects conducted in 2014–15 refined the focus of the initiative, improved access to records on Scootle (a national repository that provides Australian schools digital resources aligned to the Australian Curriculum) and provided annotated work samples of the proficiencies in the Australian Curriculum: Mathematics. The first tranche of resources is now available through the ReSolve website. (www.resolve.edu.au).

Coding Across the Curriculum

Coding across the curriculum will support the introduction of computer coding and computational thinking across different year levels in Australian schools, including:

- Creation of the Digital Technologies Hub, developed and hosted by Education Services Australia, is a collection of activities, learning sequences and other resources related to the digital technologies curriculum. It is now available to all teachers across Australia. There are currently over 19,000 users of the Digital Technologies Hub.
- Code Club, a one-off grant to support expansion of Code Club Australia. There are over 1000 schools and libraries running Code Clubs. They have trained over 600 teachers.

Science by Doing

Delivered by the Australian Academy of Science, this project supports the development of secondary science teaching and learning resources, as well as professional learning resources to support teaching by inquiry. There are over 120,000 people registered to use *Science by Doing* resources. This is around 57 per cent of all Australian high school teachers, with registrations from 80 per cent of all high schools.

Online Computing Challenges/ Cracking the Code

The Online Computing Challenges are a series of structured, progressive teaching and learning activities and challenges (for all year 5 and 7 students) that are run by teachers, during class time. Online Computing Challenges will target a combined total of 200,000 Year 5 and Year 7 students.

Cracking the Code will offer a suite of fun and engaging coding activities and challenges for Year 4–12 students, as well provide an opportunity to recognise the winners of digital technology competitions. At least 23 computing challenges will be delivered with a target of reaching 200,000 year 5 and 7 students across Australia. Cracking the Code will aim to target 400,000 students across Years 4–12.