

# **Boosting Innovation, Science, Technology and Mathematics Teaching (BISTMT) Program**

## **Consultation Paper September 2004**

### **Objective**

To promote world-class teaching and learning of science, technology and mathematics in Australian schools; encourage innovation in Australian schools and extend the innovative capacity of students; and assist in attracting to and retaining in the teaching profession sufficient numbers of high quality graduates in the fields of science, technology and mathematics.

### **Rationale**

The 2003 report of the independent Review of Teaching and Teacher Education (*Australia's Teachers: Australia's Future - Advancing Innovation, Science, Technology and Mathematics*) commissioned by the Australian Government identified a number of deficiencies, including:

- relatively poor or little teaching of science in the primary years; relatively poor student engagement in the learning of science, technology and mathematics in middle years of schooling; and a declining proportion of students continuing studies of science and maths to advanced levels in senior secondary years and at the tertiary level;
- the absence of a pervasive culture of innovation in Australian schools, and of a well developed capacity and predisposition for innovation in Australian students; and
- inadequate national data collection and analysis to support advanced teacher workforce planning, and insufficient complementary research into the condition of teaching and teachers.

### **The BISTMT Program**

The Australian Government allocated \$39 million, over seven years from 2004-05, for the Program. Under the Program:

- An estimated 500 school innovation projects will be funded to build school clusters (school partnerships with science organisations, tertiary education institutions, industry and the broader community), achieve better coordination of the teaching of science, technology and mathematics between primary and secondary schools, help connect learning across disciplines, and promote innovative approaches and cultures in schools.
- An estimated 1,300 undergraduates and early career researchers in science, technology and maths will be paid to work with teachers, to excite students' interest in these subjects and to act as role models.
- New data will be gathered and research undertaken to improve teacher workforce planning and help advance professional practice in schools.

## Program delivery

- School innovation projects to be managed under collaborative arrangements –
  - proposals might be sought from schools and/or other organisations, possibly with a State or Territory-based reference group (with representatives of government and non-government education authorities, universities, teacher professional associations ...) involved in prioritising a limited number of projects in that State or Territory,
  - proposals will be assessed against specified criteria and recommendations made on the projects to be funded, and
  - projects will be funded under formal agreements or contracts.
- Teacher assistants (including undergraduate and postgraduate students, early career researchers in science, technology and maths) might be engaged as an integral component of school innovation projects - under collaborative arrangements between schools, State and Territory government and non-government education authorities, universities and science organisations or other employers. Funds to be provided to pay the teacher assistants.
- Other possible features of the school innovation projects and teacher assistants elements of the Programme:
  - Guided by a notional allocation to school systems/groupings based on enrolments.
  - Universities and science and selected other organisations to be encouraged to help identify graduates or early career researchers to participate in the scheme.
  - Universities and science and selected other organisations to be encouraged to treat participation in the scheme as an integral component of a study or employment pathway (for example, with academic credit given towards completion of a degree).
  - Insurance, suitability screening, training and other matters relating to the engagement of teacher assistants to be handled as an identified requirement under school innovation projects.
- Data gathering and research projects to be initiated in consultation with key stakeholders, possibly with –
  - the highest priority areas of data and information need might be identified in consultation with MCEETYA/TQELT, education authorities, universities and the National Institute for Quality Teaching and School Leadership (NIQTSL),
  - decisions to be made on the most appropriate means for undertaking high priority projects (for example, as projects let through open or selective tender, as projects to be undertaken by an organisation with pre-eminent standing or expertise, or as additional studies to complement the work on teacher supply and demand being done by DEST for MCEETYA), and
  - projects might be run under direct control of, or under contract with, DEST.

## **Aims/performance measures**

- Growth in numbers of students undertaking science, technology and mathematics teacher education.
- Growth in numbers of newly qualified (including career change) teachers in Australian schools in science, technology and mathematics.
- Improved retention of teachers in these fields.
- Changes and improvements in teachers' approaches to and techniques in teaching science, technology and mathematics.
- Improved science, technology and mathematics student learning outcomes.
- Increased numbers of senior secondary students interested in, and participating in science, technology and mathematics study.
- Improved levels of coordination and continuity of science, technology and mathematics teaching and learning between primary and secondary schools.
- Increased collaboration between Australian schools and science organisations, universities and relevant industries.

## Issues for exploration

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Quantum of Program funding</i>	\$4.500 million in 2004-05	\$1.080 million in 2004-05
<i>Key partners</i>	DEST, schools, education authorities, universities, science organisations, teacher professional associations?	DEST, MCEETYA, NIQTSL, education authorities, universities?
<i>Scope to complement/dovetail with existing initiatives</i>	Are there relevant, related initiatives being run by others?	Are there relevant, related initiatives being run by others?
<i>Governance</i>	To be managed nationally on DEST's behalf and under agreements with schools or other project parties. To be run in collaboration with education authorities in each State and Territory, universities, science organisations, teacher professional associations and/or industry organisations?	Might be run by DEST in collaboration with education authorities in each State and Territory? or on behalf of MCEETYA? or with NIQTSL?
<i>Timing</i>	To be determined	

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Communicating advice about Program</i>	Education authorities through electronic newsletters? Letters to schools? Letters to identified contacts in education authorities, universities, science organisations, teacher professional associations and/or industry organisations? Advertisements in the national press? Websites?	
<i>Duration</i>	One school year or longer? One term full-time? Two or more terms part-time?	
<i>Funding range</i>	\$20,000 - \$100,000 @ average of <\$50,000? \$18 per hour (undergraduates)? 200 hours + each?	
<i>Purposes for which Project funding might be applied</i>	Engagement of specialist expertise? Teacher relief? Meetings? Professional development activities?	

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Focus</i>	<p>Middle years?</p> <p>Science, technology, mathematics</p> <p>Exclusive or indicative focus?</p> <p>Other – eg rural, Indigenous?</p>	<p>Science, technology, mathematics undergraduate and postgraduate students and those applying those skills in research, business or industry organisations</p> <p>Study to investigate the characteristics of the teaching workforce – eg how many qualified teachers in different specialty areas?</p> <p>Study to investigate the relationship between the flow of new graduate teachers and teacher needs in schools?</p> <p>Study to investigate the nature and magnitude of teacher shortages in particular specialisations and/or locations?</p> <p>Study to investigate the incidence of and reasons for early career teacher attrition?</p> <p>Study to investigate the nature and extent of out-of-field teaching?</p>

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Eligibility</i>	<p>Proposals that meet Commonwealth, education authority and school priorities?</p>	<p>No age limit?</p> <p>Minimum of 2 years undergraduate education in science, technology and/or maths?</p> <p>Satisfy screening requirements (eg police checks)?</p>
<i>Criteria</i>	<p>Potential to inform improved practice in other schools throughout Australia?</p> <p>Aligns with curriculum guidelines?</p> <p>Demonstrated commitment from partners (other schools, universities, other organisations)?</p> <p>Sustainability beyond period of project funding?</p> <p>Addresses recommendation(s) of Review of Teaching and Teacher Education?</p> <p>Due regard for schools which might require special support – eg rural and remote?</p>	<p>Academic results in a relevant area?</p> <p>Expressed interest in school teaching?</p> <p>Evidence of appropriate skills?</p>

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Identification of prospective participants</i>	Self-identification by schools and/or other organisations?	Identification locally of prospective participants by Project partners in consultation with universities, science organisations, business/industry organisations?
<i>Distribution</i>	Initial notional pro rata allocation (on basis of student enrolments) by State/Territory	
<i>Assessment of applications</i>	Two stages: initial brief expression of interest, followed by invitation to those short-listed to submit full proposals?  Short-listing by State/Territory reference groups?  Final selection by/on behalf of Commonwealth.	

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Schedule of payments</i>	<p>On commencement?</p> <p>On demonstration of satisfactory progress?</p> <p>On completion?</p> <p>Second or subsequent stages beyond initial (single year) stage to be considered subject to demonstrated successful completion of stage 1?</p>	
<i>Provision of expert guidance and support</i>	<p>“Critical friends” identified by schools and/or education authorities?</p> <p>Teacher education faculties?</p> <p>Teacher professional associations?</p>	
<i>Monitoring and reporting</i>	<p>By schools and partners to national manager.</p> <p>With involvement of education authorities?</p>	
<i>Performance measures</i>	<p>To relate to Program aims</p> <p>?</p>	

	<b>SCHOOL INNOVATION PROJECTS / TEACHER ASSISTANTS</b>	<b>RESEARCH AND DATA GATHERING</b>
<i>Dissemination of findings</i>	Existing websites – National Quality Schooling Framework? Case studies? CDs showcasing Project activities and outcomes? Newsletters?	
<i>Additional benefits for participants</i>	Enhanced profile for schools and partner institutions/organisations	Possible academic credit towards undergraduate degree and/or subsequent teacher education award

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