



Australian Government

Department of Education, Science and Training

**BOOSTING INNOVATION, SCIENCE,
TECHNOLOGY AND MATHEMATICS
TEACHING**

**EXTERNAL
PROGRAMME GUIDELINES
2004-05 TO 2010-11**

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**FUTURE SCHOOLING & TEACHER WORKFORCE SECTION
QUALITY SCHOOLING BRANCH
SCHOOLS GROUP
DEPARTMENT OF EDUCATION, SCIENCE AND TRAINING**

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Purpose

These external Guidelines provide an overview, for education stakeholders and the broader community, about the operation of the *Boosting Innovation, Science, Technology and Mathematics Teaching* (BISTMT) Programme, over the period 2004-05 to 2010-11.

1. Programme Overview

1.1 Description

The Programme is intended to raise the scientific, mathematical and technological literacy and the innovative capacity of Australian school students, to create learning environments from which more world-class Australian scientists and innovators will emerge, and to provide impetus for the development of a new generation of excellent teachers of science, technology and mathematics.

The Programme was announced with three elements:

1. National school initiatives in science and innovation - through school clusters (school partnerships with science organisations, tertiary education institutions, industry and the broader community), to promote innovative approaches and cultures in schools in the areas of science, technology and mathematics;
2. Teacher assistants– undergraduates and researchers to be placed in schools to help improve teaching and learning; and
3. Data collection and research - to inform workforce planning and advance professional practice in schools.

Elements 1 and 2 are to be integrated, with their activities being conducted as school projects under the *Australian School Innovation in Science, Technology and Mathematics* (ASISTM) Project. Teacher assistants are renamed Teacher Associates and include scientists-in-residence, peer tutors, or other terms which describe suitably skilled and experienced persons, such as a tertiary student, researcher and other specialists with expertise in science, technology and/ or mathematics.

An evaluation will be undertaken in 2007-08 to identify the outcomes from, and to assess the overall effectiveness of, the Programme.

1.2 Context

An independent *Review of Teaching and Teacher Education* (RTTE) was commissioned under the Australian Government's *Backing Australia's Ability* (BAA) strategy. The Programme addresses deficiencies identified in the October 2003 report of the Review, *Australia's Teachers: Australia's Future - Advancing Innovation, Science, Technology and Mathematics* (see: <http://dest.gov.au/schools/teachingreview/>):

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

Funding for the Programme was announced in the Australian Government 2004-2005 Budget.

The Programme is a key component of the Australian Government's \$5.3 billion, seven year package of initiatives under the second stage of *Backing Australia's Ability – Building our Future through Science and Innovation* (BAA2 – see: <http://backingaus.innovation.gov.au/>) and its investment in science and innovation, aimed at:

- strengthening Australia's ability to generate ideas and undertake research;
- accelerating the commercialisation of ideas; and
- developing and retaining skills.

The Programme will also help to advance the Australian Government's Agenda For Schools – *Achievement Through Choice and Opportunity*.

1.3 Authority

Funding for the Programme is appropriated annually by Parliament. It is not governed by specific legislation.

1.4 Programme Objectives

The objectives for the programme are to:

- encourage innovation in Australian schools and extend the innovative capacity of students;
- promote world-class teaching and learning of science, technology and mathematics in Australian schools; 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.

The Programme will contribute to the assessment and reporting of the Department of Education, Science and Training (DEST) Outcome 1, that “individuals achieve high quality foundation skills and learning outcomes from schools and other providers”.

2. Australian School Innovation in Science, Technology and Mathematics (ASISTM) school projects

2.1 Overview

Over the seven year life of the Programme, an estimated total of 500 ASISTM school projects are expected to be funded to promote innovative approaches and cultures in schools, with a focus on the teaching and learning of science, technology and mathematics. School projects will involve building school clusters (school partnerships with other schools, science organisations, tertiary education institutions, teacher professional associations, business and industry, and the broader community), thereby:- providing teachers and students with access to wider world expertise, activities and resources; fostering better coordination of teaching and learning between primary and secondary schools; and helping to connect science, technology and mathematics teaching and learning with other disciplines.

Over the seven year life of the Programme, a total of about 1,300 tertiary students, researchers and other specialists in science, technology and mathematics are expected to be engaged for a limited duration as an integral part of ASISTM school projects. They will undertake a range of possible roles to help drive the projects and promote beneficial change in schools, including working with teachers to excite students’ interest in these subjects and acting as role models to improve student outcomes and boost the number of young people choosing careers in science, mathematics and technology.

The ASISTM Project will be managed by a National Administrator (NA), accountable to DEST. A contract between DEST and the NA will detail the relationship and respective responsibilities of the two organisations. Further details on all aspects of the ASISTM Project are available from Project Guidelines which will be available from the NA.

The use of an NA is an approach that offers an organisation that can provide expert guidance and can undertake the major administrative load in relation to the planning, conduct and reporting of initiatives, and disbursement and management of funds. It also facilitates direct agreements with schools.

2.2 Consultations with stakeholders

These guidelines have been informed by advice about the design and delivery of the Programme provided by representatives of over 100 key stakeholders (university education and science faculties, education authorities, business and industry, parent and community bodies, teacher and school leader professional associations, and science

organisations) during consultations in each State and Territory conducted by DEST between July and November 2004.

2.3 Focus

ASISTM school projects will particularly aim to foster a sustained culture of innovation in schools through science, technology and mathematics teaching and learning. ASISTM school projects will promote improvement:

- in the classroom - teacher practice and student learning in relation to science, technology and mathematics;
- in the wider school - new practices in planning, resourcing, communicating and collaborating; and
- at a whole community level - with boundaries between schools and other organisations becoming more permeable, and shared goals, expectations and directions being adopted.

Innovation in schools is the practical application of an idea or ideas, new for schools involved in the project, to improve educational experiences and, hence, the learning outcomes of students. School innovation aims to change in profound and sustainable ways the culture, structure and/or conditions that shape teaching and learning. Innovative schools draw on the skills, knowledge and resources present in other schools and the wider community and collaborate to improve their students' learning experiences and outcomes. (See the 2003 Discussion paper for the Review of Teaching and Teacher Education, *Young People, Schools and Innovation: towards an action plan for the school sector*: <http://dest.gov.au/schools/teachingreview/documents/DiscussionPaper2.pdf>)

ASISTM school projects are intended to advance the key learning areas of science, technology and mathematics in schools in each State and Territory.

Science can be defined broadly as the observation, identification, description, experimental investigation, and theoretical explanation of phenomena. For the purposes of these guidelines, the definition relates to science as a key learning area that includes chemistry, biology, environmental science and physics. Students engaged in science learning develop improved understanding of the physical and biological world. Science is applied through, and builds on inquiry and knowledge from, other disciplines.

Mathematics is the study of measurement, properties, and relationships of quantities and sets, using numbers and symbols. It is a key learning area encompassing numeracy and related communication, cognition and problem solving. Mathematics is a study that develops logical reasoning and skills in communication, and uses written, spoken and visual symbols. While mathematics is a discrete learning area, it is often informed by or directed through other disciplines.

Technology is the purposeful application of knowledge, experience and resources to create products and processes that meet human needs. Within schools, it is thus both an area for study and a means of getting things done. As a learning area it embraces, but extends beyond, information and communications technology (ICT), and includes subjects as diverse as home economics, industrial arts, media, agriculture, design and textiles.

2.4 Relationship to other initiatives

ASISTM school projects are complemented by other Australian Government education-related measures under BAA2:

- expansion of the *Questacon – Smart Moves* programme to bring science, engineering and technology innovation and entrepreneurship to rural and regional secondary school students across Australia (the Questacon website is at: http://www.questacon.edu.au/index_flash.asp);
- funding of the *Science Connections* programme to raise science awareness and highlight the benefits that new developments in science and innovation bring to Australia;
- the *Fostering Scientific, Mathematical and Technological Skills and Innovation in Government Schools Initiative*; (further information available is at http://backingaus.innovation.gov.au/2004/skills/govt_schools.htm); and
- investment in additional targeted university places, with a priority on mathematics, science and information and communications technology.

ASISTM school projects are further complemented by:

- Australian Government funding for the second stage of the *National Primary School Science and Literacy Project*, (Primary Connections) being undertaken by the Australian Academy of Science (AAS);
- support under the *Australian Government Quality Teacher Programme* (AGQTP) to improve the skills and understanding of teachers in specified priority areas (including science, mathematics and technology) and to enhance the status of teaching (the national quality teaching website is at: <http://qualityteaching.dest.gov.au/Content/>);
- funding through the *Science Education Assessment Resources* (SEAR) Project to develop an online collection of science education assessment resources for teachers across the compulsory years of schooling (further information available is at <http://curriculum.edu.au/sear/>);

- collaboration between the Australian Government and State and Territory governments through the Ministerial Council on Employment, Education, Training and Youth Affairs (MCEETYA) to develop national statements of learning for science and mathematics, and key performance measures (KPMs) in a number of priority areas, including science (the MCEETYA website is at <http://www.mceetya.edu.au>);
- funding for Australia's participation in the *Programme for International Student Assessment* (PISA) (http://www.pisa.oecd.org/pages/0,2987,en_32252351_32235731_1_1_1_1_1,00.html) and the *Trends in International Mathematics and Science Study* (TIMSS) studies of student achievement (http://www.iea.nl/Home/Studies/Current_Studies/TIMSS2003/timss2003.html);
- funding for the development of National Professional Standards for Highly Accomplished Teachers of Science under the auspices of MCEETYA ; and
- funding for The Le@rning Federation *Schools Online Curriculum Content Initiative* (SOCCI) (see <http://www.thelearningfederation.edu.au/tlf2/>).

Maximum connection with and utilization of these initiatives and resources through ASISTM school projects is encouraged.

Similarly, projects will be expected to be well-connected to, and consistent with, State and Territory initiatives and policies in related areas.

2.5 Eligibility

Schools and/or their partners (including universities, education authorities, business and industry, parent and community bodies, teacher and school leader professional associations, and science organisations) are eligible to submit applications for, and to receive, project funding. Projects should be undertaken in government and/or non-government, primary and/or secondary schools. They may operate in more than one State or Territory, provided cross-jurisdictional issues are adequately addressed.

2.6 Project activities

ASISTM school projects must address one or more of the Programme objectives (1.4) and the performance measures (2.12.1) linked to the relevant objectives, and must relate to one or more of the focus areas of science, technology and mathematics. A wide range of activities may be proposed and supported.

There will be two project rounds in 2005 and one annual project round in each year thereafter. Most projects are expected to be conducted over a period of 12-18 months.

That is, projects will finish by the end of the year *following* the year in which the project agreement is signed.

ASISTM school projects are intended to result in sustained change and improvement in schools. They will be required to utilise independent expert guidance (use of a “critical friend”) and incorporate quality assurance (utilising the broad principles of the National Quality Schooling Framework). They will also need to be broadly replicable and transferable to other schools and settings. They will need to address the identified need of schools, teachers and students.

Projects are expected to reflect a balanced spread across geographic regions, government/ non-government education sectors, and learning areas. Proposals which include practical plans for involving schools facing special challenges, schools in rural and remote locations, schools with high proportions of Indigenous students, and disadvantaged schools (including those with significant number of students at risk of not completing the compulsory years), will be especially favourably regarded.

2.6.1 Teacher Associates, Critical Friends and others engaged for ASISTM projects

As part of ASISTM school projects, funding is available to support the appointment of Teacher Associates who are engaged, on a full-time or part-time, paid or voluntary basis, to assist with aspects of ASISTM projects. Teacher Associates include scientists-in-residence, peer tutors, or other terms which describe suitably skilled and experienced persons, such as tertiary students, researchers and other specialists with expertise in science, technology and/ or mathematics.

Funding will also be provided for the appointment of Critical Friends, who are suitably skilled and experienced experts identified and approved by the NA and engaged to provide expert guidance and quality assurance to ASISTM school projects.

Other individuals not currently employed by participating schools may also be engaged by project schools and their partners to work on ASISTM projects.

Managers of ASISTM school projects will be required to accept responsibility for all aspects of the screening, payment, task allocation and supervision of Teacher Associates and others they engage for ASISTM projects. The NA will manage the screening, payment and work of Critical Friends.

Screening is required for those personnel engaged with an ASISTM school project who are not employed by schools and will be working with school students. The results of any adverse checks will be reported to the NA and DEST, and will be subject to final DEST clearance. Further details on screening requirements are available in the Project Guidelines. NB The details on screening provided in the External and Project Guidelines are subject to change.

2.7 Applications and selection

Expressions of interest will initially be sought and, following shortlisting of proposals, selected project proponents invited to prepare full applications to the NA.

In relation to Round 1 (2004-05), information, expression of interest and application forms will be available online at the ASISTM website: www.asistm.edu.au. Applications will be submitted on-line through the above website, although alternative arrangements will be made for those unable to submit expressions of interest or applications in that way. Details about the way information provided by applicants will be treated are available in the Project Guidelines and the ASISTM website.

Funding will be competitive and applied on the basis of assessed merit against the specified criteria, taking into consideration need for a balanced spread of projects (see 2.6 above). Further details on the selection process, including the specified criteria, are available in the Project Guidelines.

The selection process will be undertaken by the NA, who will be responsible for ensuring that recipients comply with and satisfy selection requirements. All decisions made by the NA are final and no correspondence will be entered into, subject to the right of the Minister for Education, Science and Training, in his absolute discretion, to veto a decision made by the National Administrator.

2.8 Funding

The Australian Government is providing a total of \$33.66 million for ASISTM projects, over 2004-05 to 2010-11 inclusive, as shown below.

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
(\$m)	5.58	9.97	4.87	5.02	3.76	2.63	1.85	33.66

2.9 Responsibilities

DEST will be responsible for the overall management of the Programme, including the ASISTM school projects. It will engage the NA, liaise with stakeholders and advise and report to the Minister for Education, Science and Training on progress, outcomes and achievements of the Programme, including the ASISTM projects, and associated policy issues. It will also manage an evaluation of the Programme.

The National Administrator (NA) will be under contract with DEST. In relation to the ASISTM school projects, it will be responsible for:

- the development and maintenance of the ASISTM website;
- promoting participation in, and information about, the ASISTM projects;

- dissemination of good practice and innovative approaches;
- coordinating the project application and assessment process;
- identifying critical friends to provide guidance and quality assurance for projects;
- entering into agreements with ASISTM project managers and reporting on participation, outcomes and financial receipt and expenditure;
- co-ordinating and monitoring expenditure of funds to ASISTM school projects;
- arranging for the administration of pre- and post- surveys and the collection of data from these surveys; and
- establishing and liaising with the National Reference Group, which will advise on the design and operation of, and liaise with key stakeholders in each State and Territory about ASISTM school projects.

Leadership of ASISTM school projects will be provided either by a nominated school or other project partner. School clusters will typically consist of 4 to 12 schools and other non-school partner organisations, with examples of the latter including:

- science, technology and mathematics organisations (eg museums, hospitals and environmental organisations);
- teacher and principal professional organisations;
- tertiary education institutions; and
- industry and the broader community.

2.10 Contracts and agreements

The Australian Government will enter into a contract with the NA for the delivery of the ASISTM Project. Once funds intended for ASISTM school projects are paid by DEST to the NA under this contract, the NA will be responsible for their expenditure to the school projects and the requirements of the Financial Management Act will not apply.

The NA will enter into agreements with lead organisations in respect of school projects. School projects can be represented either by a lead school or another non-school partner organisation participating in the project, but all such agreements are subject to approval from DEST before they can be signed. These agreements will specify the conditions of funding (such as deliverables and reporting). Further details are available in the Project Guidelines.

Accountability for project outcomes will be achieved through both contractual and agreement requirements and the Australian Government's evaluation arrangements.

In general, financial and educational accountability will be met through the provision of reports. Reporting and acquittal requirements for the project will be detailed in contracts and agreements.

2.11 Progress and final reports

Reports will be expected to include matters such as: progress of individual school cluster projects, financial information on expenditure and commitments, overall progress of

school cluster projects against the programme objectives and performance measures; and information about Programme promotion and recognition requirements.

Payment will be subject to acceptance of the Progress Report as satisfactory.

2.12 Expected outcomes and follow-up

2.12.1 Performance measures

The following performance measures will be used to assess project outcomes and the effectiveness of ASISTM school projects. They are grouped under the relevant programme objective. Quantitative and qualitative information can be provided.

Encouraging innovation in Australian schools

- the fostering of a culture of innovation in schools;
- the development of an elevated capacity and predisposition for innovation in school students;
- improved levels of coordination of science, technology and mathematics teaching and learning between primary and secondary schools;
- increased collaboration between Australian schools and science organisations, universities, business and industry and other organisations;

Promoting world class teaching and learning

- growth in numbers of students undertaking science, technology and mathematics teacher education;
- changes and improvements in teachers' approaches to and techniques in teaching science, technology and mathematics;
- improved science, technology and mathematics student learning outcomes;
- enhanced student interest and engagement in the learning of science, technology and mathematics;
- increased numbers of senior secondary school students interested in, and participating in science, technology and mathematics study;

Teacher attraction and retention

- growth in numbers of newly qualified teachers in Australian schools in science, technology and mathematics; and
- improved retention of teachers in these fields.

3. Data collection and research

3.1 Priorities and procurement

Data collection and research projects will be funded into research and investigation of strategic issues relating to future workforce planning and helping to advance professional practice in schools. The Australian Government Minister for Education, Science and Training will approve funding for individual project proposals. DEST will undertake

procurement action for the projects and will be responsible for their management. Further details about these projects, (such as tenderer selection criteria and project deliverables) will be made available through tender documentation when procurement action is begun.

The Australian Government is providing a total of \$1.53 million for these projects over 2004-05 to 2010-11 inclusive, as shown below.

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Total
(\$m)	0.217	0.206	0.206	0.219	0.23	0.22	0.23	1.53

4. Contacts

4.1 ASISTM National Administrator

Enquiries about ASISTM school projects may be addressed to:

Jennifer Hope
ASISTM Project Officer
Curriculum Corporation
2 Lonsdale St
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Casselden Place
MELBOURNE VICTORIA 3000

Tel. - (03) 9657 9748
e-mail - assistm@curriculum.edu.au

Information about ASISTM, including application forms, is available at:
www.asistm.edu.au

4.2 DEST

Enquiries about the BISTMT Programme may be addressed to:

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