



Submission No 33

Inquiry into Australia's relationship with India as an emerging world power

Organisation: Department of Education Science and Training

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Australian Government

Department of Education, Science and Training

Dr John Carter
The Secretary
Foreign Affairs Sub-Committee
Joint Standing Committee on Foreign Affairs, Defence and Trade
Parliament House
CANBERRA ACT 2600

Dear Dr Carter

Inquiry into Australia's relationship with India

The Department of Education, Science and Training (DEST) welcomes the opportunity to make a submission to the Joint Standing Committee on Foreign Affairs, Defence and Trade's inquiry into Australia's relationship with India. I attach DEST's submission on Australia's bilateral education and science relationship with India.

If you have any queries regarding this submission, please contact Mr Graeme Rankin, Director, South, South East Asia and Middle East Section by phone on 6240 5163 or via e-mail at graeme.rankin@dest.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Fiona Buffinton'.

Fiona Buffinton
Chief Executive Officer
Australian Education International

15 September 2006



Australian Government

Department of Education, Science and Training

**Submission to the
Joint Standing Committee on Foreign
Affairs, Defence and Trade's inquiry into
Australia's relationship with India**

Department of Education, Science and Training submission to the Joint Standing Committee on Foreign Affairs, Defence and Trade's inquiry into Australia's relationship with India

This submission from the Department of Education, Science and Training (DEST) is in two parts reflecting the different areas of responsibility of the department. These are:

1. Education and training; and
2. Science and technology.

Overview:

Predictions that India will become the world's third largest economy within decades, aligned with its research excellence in particular areas of interest to Australia, its industry base, and thirst for education and training, signify a major potential for education, science and training cooperation with India.

Over recent years, the number of Indians choosing to study in Australia has risen rapidly, with year-on-year growth averaging 34.8% per annum in the period 2002-2005. More than 27,000 Indian students were studying in Australia in 2005, mainly postgraduate study by coursework, making India Australia's second largest market for student recruitment behind China. There are more Indian than Chinese postgraduate students studying in Australia.

India's increasing prominence as a centre for high quality scientific and technological research and development also presents significant potential for mutually beneficial research collaboration.

Accordingly, India is a high priority country for DEST, with a Counsellor, Dr John Webb, based at the High Commission in New Delhi. With the establishment of the \$20 million Australia-India Strategic Research Collaboration Fund, and a \$5 million scholarship fund, the level of engagement with India and the resources allocated by DEST to developing and maintaining the bilateral relationship in education, science and training can only increase.

Australia and India have a positive and cooperative bilateral education relationship, facilitated by strong government to government links and institutional cooperation. Over recent years, increasing numbers of educational institutions have been visiting India to develop relationships with counterpart institutions. Further, visits by State government delegations and Ministers have also increased.

The education and training relationship is underpinned by a Memorandum of Understanding (MOU). The first meeting of the Joint Working Group established under the MOU was held in Canberra last year and joint activities discussed at that meeting are still under negotiation.

The Australian Government strongly promotes the wide range of benefits international education brings to our economy and society and is concerned to ensure that international students are welcomed in Australia. Australia has a strong framework of

regulatory arrangements and safeguards for international students accessing Australian education services. These cover all education sectors, public and private, from schools to English language training to universities.

The continuing strong growth in the Indian economy, particularly in manufacturing, construction, food processing, information technology, and across the services sector, indicates the type of skills needed to maintain that growth. While the Indian education system has the capacity to absorb greater numbers, the emerging needs of the economy for a highly skilled workforce continue to create opportunities for international education.

The recent Indian Government announcement to reserve 27% of university places for students from 'Other Backward Communities' in central Government-controlled institutions will also have an impact on high profile academic institutions. Although the Government has announced that more places will be added to these institutions so that students from a general category do not face difficulty in entry, many institutions have rejected moves to increase the number of places. Therefore, competition for entry into the better institutions is likely to become tougher, creating more opportunities for international education.

This also needs to be seen in the context of funding for higher education. Primary education continues to be the priority for the government and increases in budgetary allocation for education are directed towards this sector. Allocations for higher education for the last few years have remained static and the situation appears unlikely to change.

One of the possible ways to reduce the pressure on higher education is to revitalise the VTE sector in India. Although the National Policy on Education makes a commitment to introduce reforms in this sector, this task has remained unfulfilled. Over the last 3 years, Australian Education International (AEI), DEST's international education arm, has been working with the Government of India to propagate a model based on the Australian vocational and technical education (VTE) system and particularly the Australian Qualifications Framework (AQF).

The Indian Govt pursued development of such a framework, but political change at the centre derailed this process. The present Government has shown positive inclination to restart the work in this area, as it is believed that a vibrant VTE sector is an answer to many of India's contemporary education problems. With both industry and services sectors showing high growth rates, a vibrant VTE sector will be the answer to meet the demand for the skills required to support this growth.

In this context, Australia's ongoing reforms in the VTE sector over recent years has created a system that is highly responsive to industry/employer needs, provides the flexibilities of school-based apprenticeships, pathways, recognition of prior learning, and a high quality of training. There is considerable potential for Australia's education and training services to contribute towards meeting the skills development needs of India's booming economy.

One of the weaknesses of Australia-India engagement in education has been the weak linkages in science and technology. India's education relationship with the US and with Europe has largely been determined by engagement in science and technology. This relationship, to a large extent, has also determined student outflow.

The new paradigm, in which Australia sees India as a priority partner for bilateral collaboration in science and technology, is bound to change the overall engagement in education. This paradigm shift is in recognition of India's emergence as a significant player in the global economy, particularly in science and innovation as well as Australian stakeholders' enthusiasm to engage with Indian academics.

There has also been a significant increase in the level of interest in India by Australian research agencies. The substantial nature of India's science and technology effort offers excellent opportunities to Australian researchers. The programme of collaboration with India through the Australia-India Strategic Research Fund aims to raise Australia's profile in science and technology, leverage access to the Indian S&T system; and engender goodwill between the parties.

One of the challenges therefore will be to leverage science and technology activities under the research fund to project Australia's research and development capabilities and use these to facilitate movement of quality students to Australia.

Another challenge for Australia in 2006-07 is to convert the high level of activity by AEI India, Australian State Governments and education institutions undertaken in 2005-06 into long-term gains and the establishment of a higher level profile for Australian education, science and training in India. We have the opportunities at the government level to influence this challenge through the Joint working Groups established under the Education Exchange Programme and the MoUs on Science and Technology.

The role of Australian Education International, Department of Education, Science and Training

Australian Education International (AEI) is a division of the Australian Department of Education, Science and Training (DEST). AEI uniquely integrates the development of international government relations with support for the commercial activities of Australia's education community. To do this, AEI liaises with all sectors of the education and training industry and all levels of government.

AEI develops Memoranda of Understanding and facilitates dialogue on the issues of education, and training with governments around the world, as well as managing Australia's education interests in major international and regional strategic fora. It has an International Network of staff, including a Counsellor and an office in New Delhi. This office also has responsibility for the AEI office in Islamabad, Pakistan, and for Bangladesh, Sri Lanka, Nepal and Bhutan.

AEI promotes Australia's education and training capabilities through a range of strategies including brand positioning, promotional events, marketing materials, the multilingual Study In Australia website and in-country communications campaigns. AEI also administers national legislation for financial and tuition assurance mechanisms and codes of practice such as the *Education Services for Overseas Students Act* (ESOS) and the Commonwealth Register of Institutions and Courses for Overseas Students (CRICOS). AEI provides assessment services, information and advice on the recognition of educational and professional qualifications and skills from around the world through the National Office for Overseas Skills Recognition (NOOSR).

Memoranda of Understanding

DEST and Indian Ministries have three memoranda of understanding on:

- Education and Training Cooperation: the 'Education Exchange Programme' agreement, signed on 23 October 2003 during the visit to India of then Minister for Education, Science and Training, the Hon Brendan Nelson MP, covers such areas as staff and student exchange, joint seminars and conferences, etc. Parties to the agreement are DEST and the Indian Department of Secondary & Higher Education, Ministry of Human Resource Development. The major point of interaction is through a bilateral Joint Working Group (JWG), which held its first meeting May 2005 in Canberra.
- Science and Technology Cooperation: an MOU between DEST and the Indian Department of Science and Technology (DST) was also signed on 23 October 2003. The first meeting of the Joint Science and Technology Committee was held in July 2005. Joint activities arising from the JSTC mainly concern an agreed series of scientific symposia to be conducted over the next 2 years. Details are provided below under "Science and Technology (S&T)".
- DEST and the Indian Department of Biotechnology signed a Memorandum of Understanding on scientific and technological cooperation in biotechnology in March 2006, during the Prime Minister's visit to India.

Under the Education Exchange Programme, DEST funded a research exchange project sponsoring the exchange of students and academic staff between higher education institutions and research agencies in Australia and India. Negotiations are underway to ascertain who will fund a second stage of this project, which may be widened to the Vocational and Technical Education sector.

Education and Training Cooperation

Joint Working Group Meeting, April 2005

At the Australia-India Joint Working Group on Education and Training Cooperation meeting held in Canberra on 24 May 2005, a number of areas for potential cooperation were identified and agreed including collaborative research in educational policy; research student exchange; encouraging institutional collaboration; capacity building programs (particularly in regard to vocational and technical education); distance learning; and recognition of qualifications. Discussions on implementation are ongoing through AEI India.

It was agreed that the next meeting of the JWG will be held in India in 2006-07.

Student Recruitment

At a time when there are declining enrolments from some traditional source countries, India is an increasingly important market for Australia's international education sector and currently, a record number of Indian students are choosing to study in Australia. Based on visa data obtained by AEI India, Australia is now the second most popular destination of choice for Indian students choosing to study abroad, behind the USA, marginally ahead of the UK, but well ahead of other competitor nations.

Country	US	Australia	UK	Canada	France	New Zealand	Ireland
Enrolments for 2006 to 30 June.	80,466	26,548	20,000	6000	4000	3670	2000

India is now the second ranked source of international students (up from 4th in 2004 and 8th in 2003), both overall and for higher education, and the top source of post-graduate students. India is also now the top ranked source of Computing Science and Engineering students for Australia. A total of 27,661 Indian students studied in Australia in calendar year 2005.

As shown in the table below the growth rate in enrolments experienced in 2003 was 26%, 45% in 2004 and 33% in 2005, an average of nearly 35% per annum over the period.

Enrolment data for the year to date to 30 June 2006 is more than encouraging, with an overall growth in enrolments of just over 89% over the same period last year, indicating that 2006 will experience very strong growth. Of particular note is the significant growth in the vocational and technical education sector, with enrolments increasing by 185% over the same period in 2005, and 43.67% growth in enrolments over the entire calendar year 2005.

	2002	2003	2004	2005	2006 YTD*	Change on same period 2005
Higher Education	8,872	12,307	17,870	22,279	19,480	13.7%
VTE	2,237	1,409	1,583	3,876	5,569	185.0%
Schools	65	53	52	51	54	38.5%
ELICOS	83	468	1,103	1,307	1,260	113.2%
Other	90	113	141	148	185	94.7%
Total	11,347	14,350	20,749	27,661	26,548	89.02%
% Change over previous year		26.5%	44.6%	33.3%		

* to 30 June 2006. All other data are for complete calendar years.

DEST has received many approaches regarding the additional requirement in the student visa application that was brought into effect in 2005. This now requires Indian student applicants to show evidence of two years' funding support, rather than the previous requirement to demonstrate funds for one year's study. As the maximum study loan that can be obtained in India is \$A 45,000, this has a potential to dampen the rising demand for an Australian education.

Higher Education

Over eighty percent of Indian students studying in Australia study are enrolled in the higher education sector, and the vast majority of these, some 84%, are undertaking postgraduate studies, mainly Masters by coursework. (See *Attachment A*)

Moreover, enrolments are heavily concentrated in three disciplines with a total of 86.6% of Indian higher education enrolments in the disciplines of Business Administration and Management (38.3%), Computer Science and Information Systems (38.1%) and Engineering and Surveying (12.2%).

This concentration is consistent with previous years' enrolments and is again being borne out in 2006, with enrolments in the year to date to 30 June 2006 in these three broad areas of study comprising 87.04% of all higher education enrolments (Business Admin 44.2%; Computer Science 32.53%; and Engineering 10.49%).

Vocational and Technical Education (VTE)

As in the higher education sector, the majority of Indian students (84.9% in 2005) undertaking VTE courses are enrolled in three broad study areas. However, the situation is even more pronounced, with 58.6% of enrolments in Services, Tourism and Hospitality, followed by Business Administration with 14.9% and Computer Science 11.5%. The remainder of enrolments are thinly spread across the remaining areas of study. (see *Attachment B*)

Calendar year to date data to 30 June 2006 is consistent with this pattern with Services, Tourism and Hospitality dominating enrolments with 65.8% of the total. Business studies and computer science again come second and third, albeit with reduced shares, with 11.87% and 6.8% respectively.

An interesting development in VTE enrolments, apart from the dramatic increase in enrolments mentioned above and the increasing dominance of services, tourism and hospitality as the preferred area of study, is that the growth in students undertaking services, hospitality and tourism training in Australia is mainly benefiting private training providers and, of those, mainly Victorian and NSW providers. Some providers are experience growth in excess of 500% year on year and in one case over 1500%.

One driver of the strong growth in services, hospitality and tourism is the growth in tourism to India and the need to train staff for the influx of tourists to the 2010 Commonwealth Games to be held in India. The Games also present major opportunities for building and construction-related trades training.

Rooms in quality hotels in India are highly priced but these hotels are experiencing, even now, occupancy rates of up to 99%. There is a major need for new hotels to come on stream in the immediate future, not least to allow current quality operators to refurbish, against which current demand and the consequent loss of revenue militate, and to meet the demands of increased tourist numbers around and during the Games.

The Indian Government has identified Australia's VTE system as a model for its own reforms in technical education; and DEST is planning a VTE delegation to travel to India later in 2006. This will, *inter alia*, examine the opportunities for Australian providers to develop linkages with Indian institutions as well as delivery of Australian programmes in the region.

Endeavour India Research Fellowships and Executive Awards

The Prime Minister announced funding of \$5m over five years for the Endeavour India Research Fellowships, during his visit to India in March 2006. These aim to:

- enable high achieving scholars from India to undertake research in Australia and for Australians to do the same in India;
- further develop award holders' knowledge and skills in their field of study;
- strengthen bilateral ties between Australia and India;
- showcase Australia's education sector around the world;
- strengthen mutual understanding between the peoples of Australia and India; and
- build international linkages and networks.

The Fellowships provide financial support for postgraduate students and postdoctoral fellows from India to undertake short-term research, in any field of study, in Australia; and from Australia to undertake short-term research, in any field of study, in India. The research project must be taken in one block, it cannot be broken into two or more visits to the host country. Award holders are expected to return their home country at the conclusion of their award.

Up to ten (10) awards will be offered in 2007:

- five (5) awards for Indian scholars to undertake research in Australia in any field of study; and
- five (5) awards for Australian scholars to undertake research in India in any field of study.

Awards are valued at up to A\$25,000. Benefits include:

- travel allowance of A\$5,000;
- establishment allowance of A\$5,000; and
- a monthly stipend of A\$2,500 for up to six months.

The award is for four to six months duration with funding paid on a pro-rata basis.

The Endeavour Executive Awards for India (\$1.5 million over five years) announced by the Prime Minister in March 2006, are two-way, providing professional development opportunities for high achievers in business, industry, education or government from India and Australia. An example could be secondary school principals from India

working side by side with their Australian colleagues in counterpart schools. These awards allow professionals the opportunity, on returning home, to share their updated skills and knowledge with colleagues. They will also establish ongoing linkages and networks.

Up to twelve (12) awards will be offered in 2007:

- up to six (6) awards to Indian professionals; and
- up to six (6) awards to Australian professionals.

Awards are for one to four months duration and are valued at up to A\$25,000, with a stipend paid monthly on a pro-rata basis. Benefits include:

- a travel allowance of \$5,000;
- an establishment allowance of \$5,000; and
- a monthly stipend of \$3,750 for up to four months.

Institutional Linkages with India/Onshore Course Delivery

Up-to-date information is not available to the number and type of institutional linkages between Australian and Indian Universities.

According to information from the Australian Vice-Chancellors' Committee (www.avcc.edu.au/content.asp?page=/policies_programs/international/activities/index.htm), twenty-one Australian universities had formal links with Indian higher education institutions in 2003. A table setting out the links is at *Attachment C*.

However, given the significant increase in the number of visits to India by Australian universities in the period 2003 to present, it can be assumed that the number of formal institution-to-institution linkages, and the number of Australian courses delivered in India by Australian institutions has increased.

The Group of Eight is particularly interested in India. A delegation of Go8 Vice Chancellors is planned to visit India in September/October. It is also likely that there will be some other India-related Group of Eight activities during 2006, including a number of engineering workshops to be co-hosted by the Group of Eight universities and Indian Institutes of Technology.

During the Prime Minister's visit to India in March 2006, the programme included the signing of two new programmes of cooperation between Australian and Indian educational institutions, which will see the substantial education links between Australia and India continue to strengthen and develop.

Monash University, in collaboration with BHP Billiton, is partnering with the Indian Institute of Technology Mumbai (IIT Mumbai) to establish a joint institution for scientific research, while the University of New South Wales has also formalised a partnership with IIT Mumbai to develop collaborative research programmes in computer science.

Science & Technology (S&T) collaboration with india

Measures to strengthen Australia's S&T relationship with India

DEST regards India as a priority partner for bilateral collaboration in science and technology (S&T). India's status as a priority partner is in recognition of India's position as an increasingly significant player in the global science and innovation system as well as an increased level of interest in pursuing collaborative research with India by Australian science stakeholders.

DEST is the key agency responsible for a number of bilateral agreements for cooperation in S&T with India. DEST interacts with the Indian Government through three Departments of the Ministry of Science and Technology. These include the Department of Science and Technology (DST), the Department of Biotechnology (DBT) and the Department of Scientific and Industrial Research (DSIR). These agreements include:

- A Letter of Intent on the Management of the Australia – India Strategic Research Fund (2006);
- an MOU with DBT on Cooperation in Biotechnology (2006);
- an MOU with DST on Cooperation in Science and Technology (2003); and
- a Special Arrangement with DSIR for Cooperation in Science and Technology (1991); and
- a Government Treaty for Cooperation in the Fields of Science and Technology (1986)

DEST's key role under these agreements is to promote and foster closer scientific collaboration between Indian and Australian scientists.

DEST's programme of engagement with India is implemented in consultation with other key science and technology organisations, including Commonwealth Science and Industrial Research Organisation (CSIRO), the Australian Research Council (ARC), the National health and Medical Research Council (NHMRC), Australian Centre for International Agricultural Research (ACIAR), the Australian Institute for Marine Sciences (AIMS), the Australian Vice-Chancellors' Committee (AVCC), Australian Academy of Science (AAS), Academy of Technological and Engineering Sciences (ATSE), Biotechnology Australia and the Department of Industry, Tourism and Resources (DITR). Each of these has its own active relationship with India.

Overall Role of DEST Science Group

DEST aims to ensure that Australia has a strong science, research and innovation capacity and is engaged internationally on science, education and training to advance our social development and economic growth. The Department's Science Group works towards achievement of that goal by:

- Strengthening Australia's ability to generate and use new knowledge

- Enhancing research and development in key national priority areas
- Enhancing innovation performance through a strengthened science and technology base
- Developing facilities to safely manage Australia's low and intermediate level radioactive waste
- Strengthening and diversifying national and international linkages and collaboration.

It also has a whole of government advising role, including:

- Servicing the Office of the Chief Scientist and the Prime Minister's Science, Engineering and Innovation Council (PMSEIC), that provides independent advice to the Government
- Chairing the Coordination Committee on Science and Technology (CCST), comprising heads and deputy heads of Australian Government departments and agencies with an interest in science and technology
- Providing support for the Minister's involvement in other Government science and technology-related fora.

Under its international science programme Science Group promotes Australia's engagement in international science and technology by:

- Managing the Australia-India Strategic Research Fund
- Managing the International Science Linkages Programme
- Negotiating and coordinating bilateral science and technology agreements
- Managing Australian participation in multilateral fora, including:
 - OECD Committee on Science and Technology Policy
 - OECD Global Science Forum
 - APEC Industrial and Science and Technology Working Group
- Undertaking research on international science and technology issues.

Australia-India Strategic Research Fund

DEST's programme of collaboration with India aims to raise Australia's international profile in science and technology and establish ongoing relationships between Australian and Indian scientists.

The AISRF was announced by the Prime Minister during his visit to India during March 2006. Funding for the AISRF is provided through the *Australian Scholarships* initiative which provides nearly \$1.4 billion in funding over five years, principally for educational scholarships in the Asia-Pacific region.

The AISRF will facilitate and support science and technology research cooperation between Australia and India through the provision of \$20 million in Australian funding over five years from FY 2006/07. India has undertaken to provide matching funds. The aim of the AISRF is to:

- assist Australian researchers to increase their participation in leading edge scientific research with Indian scientists;
- facilitate Australia's access to the global S&T system by supporting bilateral relations with India; and
- support the development of strategic alliances between Australian researchers and Indian researchers and industry.

The AISRF will also increase Australia's capacity to attract Indian R&D investment, promote innovation, and increase the economic and social impact of Australian research.

Funding available through the AISRF will provide support on a competitive basis for Australian participation in international collaborative scientific and research projects. Supported projects will draw on the complementary strengths of Australia and India and will meet the objectives of the AISRF. The AISRF will be jointly managed by the DEST and the Indian Government.

The Australian Government also intends to retain the option to strategically apply funding to promote effective research collaboration to establish, reinforce and leverage strategic links and relationships with Indian counterparts. In making strategic allocations DEST may consult with the Australian research community, industry and government to identify activities that will be likely to best contribute to the objectives of the AISRF.

At the time of developing this submission negotiations with the Indian Government are progressing in relation to the bilateral management and delivery principles of the AISRF. It is expected that there will be a competitive call for proposals for workshops and collaborative research proposals during 2006/07 in a number of agreed priority areas. Pending results of the first competitive round it is anticipated that a number of collaborative projects and workshops will be funded and commence by the end of 2006.

Joint Science and Technology Committee and Joint Biotechnology Committee

Under the MOU for Cooperation in Science and Technological Research signed with the Indian DST in 2003, a Joint Science and Technology Committee (JSTC) was established to supervise a programme of cooperation in S&T between Australia and India. The JSTC consists of representatives from Government science and technology-based organisations and also includes representatives from other relevant organisations. Meetings of the JSTC provide an opportunity to discuss Government science initiatives, priority areas for collaboration, and the mechanisms for collaboration.

Under the MOU in biotechnology signed with the Department of Biotechnology (DBT) in March 2006, a Joint Biotechnology Committee (JBC) was established to supervise a programme of cooperation in S&T between Australia and India. The JBC consists of representatives of DEST and DBT as well as other mutually agreed experts.

Although arrangements for the management of the AISRF are still under negotiation and yet to be formalised, both the JSTC and JBC are likely to have active roles in the management of the AISRF.

Opportunities for collaboration

India's S&T prospects

As a result of the increasing focus of India's S&T effort there are considerable opportunities for Australia to benefit from an increased engagement between Australian and Indian researchers.

Given the rapid pace of globalisation, fast-depleting natural resources, increasing competition among nations and the growing need to protect intellectual property, the importance of strengthening the knowledge base is an important issue recognised by the Government of India.

India's scientific vision is aimed at attaining technical competence and self-reliance, reducing vulnerability especially in strategic areas and fully utilising indigenous resources. In 2003 the Government of India issued a new Science and Technology Policy which emphasised the need for involving all citizens in S&T to realise the benefits for the welfare of the population. While the 2003 policy is a statement of general intent, it elaborates a framework for taking S&T to a new height.

Indian Science System

India has developed an effective science and technology (S&T) system with a strong focus on achieving national goals. In a number of strategic sectors India has demonstrated outstanding prowess by being able to independently:

- build and operate nuclear reactors, including Fast Breeder Reactors (FBRs);
- build and launch satellites including cryogenic technology for Geosynchronous Satellite Launch Vehicles (GSLV), and the application of space technology for communications, natural resource management, meteorological services etc.

Although the S&T infrastructure facilities in a number of strategic areas, as well as areas of the basic sciences, have been strengthened significantly over recent years, this infrastructure is not solid enough to take on the national challenges in some key areas. Ageing instrumentation is also a problem in a large number of India's research laboratories and academic institutions since scientific instrumentation changes at a very fast pace and has an increasingly shorter shelf life. India has nevertheless demonstrated its strengths in several areas of research and development which has led to it achieving self-sufficiency in food grain production; eradication of some communicable diseases; substantial decreases in infant mortality rates and increased life expectancy; and the development of indigenous technologies and their commercialisation particularly in health, engineering, drugs, agriculture, electrical systems.

India has also emerged as a significant basic research power, with world class scientists in almost all areas of basic research. Indian scientists have built world class facilities like Giant Metre Wave Radio Telescope (GMRT), Variable Energy Cyclotron, Synchrotron Radiation Sources and are also in the process of building a

superconducting cyclotron and a superconducting steady state Tokamak. The GMRT, consisting of 30 antennas, each 45 meters across and distributed over 15km, is the world's largest low-frequency radio telescope and India's biggest basic science project. The GMRT is a crucial prelude for the development of the next generation radio telescope, the Square Kilometre Array. At the international level, India is now participating as an equal partner in several front-ranking experiments like the Compact Mono Solenoid (CMS) experiment and a large ion collider experiment (ALICE) experiment at the European Organisation for Nuclear Research, CERN, Geneva. Other international collaborations include experiments at the Fermilab in the United States and, in Japan, the frontier research programs of RIKEN and the high energy physics facilities at KEK.

The Indian Government to date has been the main source of funding S&T activities. As a result focus has been on important areas of basic research, technology development, demonstration and dissemination including strengthening and creation of infrastructure facilities, development of skilled and trained manpower and providing technology for societal benefits in the fields of space sciences, nuclear sciences, ocean sciences, biotechnology, scientific and industrial research and science and technology.

Indian Ministry of Science

The Ministry of Science and Technology incorporates the Departments of Science and Technology, Biotechnology, and Scientific and Industrial Research. The constituent departments of the Ministry are the principal agencies with which DEST interacts with India on matters of S&T. There are however, other Indian departments which have portfolio responsibilities for specific areas of science such as atomic energy, space, ocean development and defence research and development.

The key departments with portfolio responsibilities for different aspects of science and technology within India include:

- Department of Science and Technology
- Department of Biotechnology
- Department of Scientific Industrial Research / Council for Scientific and Industrial Research
- Department of Space
- Department of Atomic Energy
- Department of Ocean Development
- Ministry of Defence: Research and Development

Recently there has been a significant increase of Indian Government funding for the various science and technology departments. During 2005-06, the Indian Government allocated a sum of AUD 3.8 billion for science and technology, an increase of 24% over the previous year.

Government of India Budgetary Allocations for Science and Technology

Department	2003-04		2005-06		% Growth
	Million INR	Million AUD	Million INR	Million AUD	
Atomic Energy	23,350	706	28,950	875	24
Ocean Development	2,300	70	3,770	114	64
Science and Technology	13,376	404	16,360	495	22
Biotechnology	3,330	101	4,586	139	38
Scientific and Industrial Research	12,900	390	15,570	471	21
Space	25,400	768	31,480	952	24
Defence-Research and Development	23,431	709	28,144	851	20
TOTAL	104,087	3,147	128,860	3,897	24

One of the focuses of the Indian Government is the strengthening of application-oriented R&D for technology generation; promoting human resource development, especially in terms of encouraging bright students to take up science as a career; encouraging research in and application of S&T for forecasting, prevention and mitigation of natural hazards; integrating the developments in science and technology with all spheres of national activities; and harnessing S&T for improving livelihood, employment generation, environment protection and ecological security.

The Indian Government plans to lay greater emphasis on the development of indigenous technologies and focus on latest technologies available elsewhere. It also emphasises the need for focussing attention on areas where India has a competitive edge globally and where the benefits of S&T can percolate to people who have been denied these benefits so far. It recognises that this will require emphasis on the development of innovative technologies to meet the country's needs and to preserve, protect and add value to indigenous resources and biodiversity and protect and preserve the country's rich traditional knowledge.

India is placing a significant emphasis on areas such as information technology (IT) and biotechnology, where it possesses comparative global strength. Other areas of focus include: agriculture and agro-based industries; and infrastructure sectors such as energy, transportation, communication and housing. An important aspect of India's approach is to integrate S&T into various policies and programs covering the economic, energy, environmental and other socio-economic sectors.

ATTACHMENT A:

Higher Education Commencements & Enrolments by Indian Students (CY 2005) by Discipline

	Architecture, Building	Arts, Humanities and Social Sciences	Business Administration, Management	Computer Science, Information Systems	Dental Services	Economics	Education	Engineering, Surveying	Health, Community Services	Resources, Animal Husbandry	Language Studies	Law, Legal Studies	Life Sciences	Mathematics	Medical Science, Medicine	Multi-Field Education	Nursing	Pharmacy	Physical Sciences	Science	Services, Hospitality, Transport	VTErinary Science	Visual and Performing Arts	Total
Commencements	92	133	4,505	2,759	8	46	104	1,001	127	25	2	22	53	10	82	23	123	16	62	139	120	6	56	9,514
Enrolments	198	317	8,536	8,473	19	127	169	2,726	225	56	3	54	140	17	164	50	173	41	141	313	224	14	99	22,279

Higher Education Commencements and Enrolments by Level 2004 and 2005

Period	Associate Degree		Graduate Certificate		Graduate Diploma		Bachelor Degree		Masters Preliminary		Masters Coursework		Masters Research		Doctor of Philosophy		PHD & Higher Doctorate Qualifying Program		Total	
	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004	2005	2004
Commencements	0	1	50	32	876	487	1552	1,104	5	4	6,827	8,295	90	78	113	104	1	0	9,514	10,105
Enrolments	1	1	57	39	1101	856	3492	2,840	13	15	17,100	13,705	193	135	321	262	1	0	22,279	17,853

Notes:

- 86.6% of Indian students are enrolled in 3 disciplines - Business Administration and Management (38.3%), Computer Science and Information Systems (38.1%) and Engineering (12.2%).
- 84.32% of all higher education enrolments by India students are at postgraduate level.
- Source: Australian Education International

ATTACHMENT C: Institutional Links Between Australian and Indian Universities

Source: http://www.avcc.edu.au/content.asp?page=/policies_programs/international/activities/index.htm

Australian University	Name of Institution	Country	Student Exchange	Study Abroad Program	Staff Exchange	Academic/ Research Collaboration	Status of Agreement	Year of Agreement	Active
Central Queensland University	Visu Consulting	India				Yes	In place	1996	No
Deakin University	IIT Kharagpur	India	No	No	No	Yes	In place	1999	Yes
Edith Cowan University	Dr Mahalingam College of Engineering & Technology	India	No	No	No	Yes	In place	2001	Yes
Griffith University	Nirma Institute of Management	India	Yes	Yes	Yes	Yes	In Place	2002	Yes
Griffith University	Loyola Institute of Business Administration	India	Yes	Yes	Yes	Yes	In Place	2002	Yes
Griffith University	Nalsar University of Law	India	Yes	Yes	Yes	Yes	In Place	2001	Yes
La Trobe University	Apollo Hospitals Group	India					In place	2001	
La Trobe University	Center for Management Development	India	Yes	No	Yes	Yes	In place	1999	Yes
La Trobe University	Delhi University	India	Yes	Yes	Yes	Yes	In place	1991	Yes
La Trobe University	Lady Shri Ram College	India	Yes				In place		
La Trobe University	Teri School of Advanced Studies	India					Being negotiated	2003	No
Monash University	Jadavpur University, Calcutta	India	No	No	No	No	Being negotiated		No
Monash University	University of Bangalore	India	No	No	No	No	Being negotiated		No
Monash University	University of Delhi	India	No	No	Yes	Yes	Being negotiated		No
Queensland University of Technology	Hyderabad National Collegiate Board, Bombay	India	No	No	Yes	Yes	Being negotiated	2000	No
Queensland University of Technology	Indian Institute of Technology, Kanpur	India	Yes	No	Yes	Yes	In place	1993	Yes
Queensland University of Technology	Indian Institute of Management, Bangalore	India	No	No	Yes	Yes	In place	2000	Yes

Australian University	Name of Institution	Country	Student Exchange	Study Abroad Program	Staff Exchange	Academic/ Research Collaboration	Status of Agreement	Year of Agreement	Active
Technology Queensland University of Technology	Asia-Pacific Institute of Management	India	Yes	No	No	No	In place	1997	Yes
Queensland University of Technology	Management Development Institute Gurgaon	India	No	No	Yes	Yes	In place	1998	Yes
Queensland University of Technology	Vellore Engineering College	India	Yes	No	Yes	Yes	In place	1999	Yes
Queensland University of Technology	Indian Institute of Management, Calcutta and Indian Institute of Management, Lucknow	India	Yes	No	Yes	Yes	In place	2001	Yes
Southern Cross University	Aptech Limited	India	No	No	No	Yes	In place	2002	Yes
Swinburne University of Technology	Osmania University, Hyderabad	India	Yes	No	Yes	Yes	In place	1993	No
The University of Adelaide	Dr YS Palmar Univ of Horticulture & Forestry	India	Yes	No	Yes	Yes	In place	2000	Yes
The University of Adelaide	Osmania University	India	Yes	No	Yes	Yes	In place	1998	
The University of Melbourne	Indian Institute of Science Bangalore	India	Yes		Yes	Yes	In place	1999	
The University of Melbourne	Indian Institute of Technology Delhi	India	No		Yes	Yes	In place	2000	
The University of New England	The Maharaja Sayajirao University of Baroda, Vadodara, Gujarat	India	No	No	Yes	Yes	In place	1999	Yes
The University of New South Wales	BITS Pilani	India	Yes	No	Yes	Yes	In place	2003	Yes
The University of New South Wales	Central Mining Research Institute of India	India	No	No	Yes	Yes	Being negotiated		
The University of New South Wales	Indian Institute of Management Bangalore	India	No	No	Yes	Yes	In place	2003	Yes

Australian University	Name of Institution	Country	Student Exchange	Study Abroad Program	Staff Exchange	Academic/ Research Collaboration	Status of Agreement	Year of Agreement	Active
The University of New South Wales	Institute of Management Development & Research, India	India	No	No	No	No	In place		
The University of New South Wales	Jawaharlal Nehru University	India	Yes	No	Yes	Yes	Being negotiated		
The University of Newcastle	Indian Nursing Council	India		Yes	Yes	Yes	In place	2001	
The University of Newcastle	Novo Nordisk Health Care (Asia Pacific) Pte Ltd	India				Yes	In place	1998	
The University of Sydney	Manipal Institute of Technology	India				Yes	In Place	2003	Yes
The University of Sydney	Vellore Institute of Technology Deemed University	India	Yes		Yes	Yes	In Place	2003	Yes
University of Canberra	National Institute of Information Technology	India	No	No	No	Yes	In place	1998	Yes
University of South Australia	Christian Medical College and Hospital, RUHSA	India	No	No	Yes	Yes	In place	1999	Yes
University of South Australia	Dr Reddy's Heritage Foundation	India	No	No	Yes	Yes	In place	2001	Yes
University of South Australia	JSS College of Pharmacy	India	No	No	Yes	Yes	In place	1997	Yes
University of South Australia	JSS Mahavidyapeetha, Mysore	India	No	No	Yes	Yes	In place	2001	Yes
University of South Australia	KJ Hospital, Research and Postgraduate Centre	India	No	No	Yes	Yes	In place	2001	Yes
University of South Australia	Sri Ramachandra Medical College and Research Institute	India	No	No	Yes	Yes	In place	2001	Yes
University of South Australia	The Indian Institute of Technology Madras	India	No	No	Yes	Yes	In place	2002	Yes
University of South Australia	The University of Madras	India	No	No	Yes	Yes	In place	2001	Yes
University of Tasmania	Central Institute of Higher Tibetan Studies	India	Yes	Yes	Yes	Yes	In place	1997	Yes
University of Technology, Sydney	Annamalai University	India	No	No	Yes	Yes	In place	2002	Yes
University of Western	Tamil Nadu Agricultural University	India	No	No	Yes	Yes	In place	1999	Yes

Australian University	Name of Institution	Country	Student Exchange	Study Abroad Program	Staff Exchange	Academic/ Research Collaboration	Status of Agreement	Year of Agreement	Active Agreement
Sydney University of Wollongong	Dept of Mining Engineering, Banaras Hindu University	India	No	No	No	Yes	In place	1994	Yes