

report on performance

Stimulating innovation, research and growth



Highlights

Key highlights for this objective in 2002–2003:

- › provided additional programs in mathematics and science for 21 319 students through a network of eight Technology, Mathematics and Science Centres of Excellence
- › enabled science, maths and technology teachers to develop and deliver online learning courses through the Learning Place
- › recorded the highest growth nationally for attracting international students to universities in Queensland
- › recorded an increase in the number of postgraduate research places available in Queensland to 4290
- › hosted the International Regional Heads of Education Forum, which brought together education leaders from eight South-East Asian countries.

Research and innovation build the foundation for Queensland's future in a global knowledge economy. The capacity to innovate, apply knowledge to productive ends and exploit the benefits of new ideas is critical to our long-term growth and competitiveness. The New Basics trial has included a rigorous research program that is providing information on student performance, classroom dynamics and teacher practice. Universities are also crucial to this effort, often leading innovative research internationally and providing core training and development for future researchers.

The department is currently building and implementing a robust, systematic and strategic approach to research through the following activities:

- › coordinating, monitoring and assessing the alignment of internal and external research activities with the department's strategic priorities
- › coordinating departmental submissions to the Commonwealth-funded National Fund for Educational Research (NFER) to support applied research in areas of national significance
- › undertaking futures-oriented research activities that support evidence-based decision making and long-term strategic policy and planning within the Education portfolio.

Maximising the benefits of our research effort

Strategy

Supporting university research and innovation in collaboration with other government agencies

Developing the commercial potential of research outcomes

In 2002–2003, the department assisted universities to develop the commercial potential of their research outcomes and intellectual property. The Office of Higher Education collaborated with other State Government agencies and universities to work towards reaching agreement on a common interpretation of universities' commercial powers within Queensland legislation. When finalised, this agreement will enable universities to plan and undertake relevant commercial ventures with confidence and certainty while, at the same time, providing the State Government with the necessary financial assurances and checks and balances. Universities will be able to capitalise fully on their extensive intellectual property in accordance with the goals of the Government's Smart State initiative.

Aligning research priorities

The department worked with the Department of Innovation and Information Economy to develop the Queensland Research and Development Strategy. This strategy describes the six key priorities for future research and development in Queensland, which are:

- › enabling technologies
- › environmentally sustainable Queensland
- › foods for the future
- › safeguarding Queensland
- › sustainable health
- › tropical futures.

Queensland's universities contribute substantially to the state's research and development effort. These priorities target research in key areas of existing strength and recognise emerging areas of opportunity. They focus on sustainability and generating sound environmental, economic and social outcomes.

The department also worked with the Commonwealth to establish a set of national research priorities. This helped to ensure national and state priorities align strategically, positioning Queensland universities to more effectively develop strategic national partnerships and attract a greater share of Commonwealth research funding.

Strengthening foundations for future research

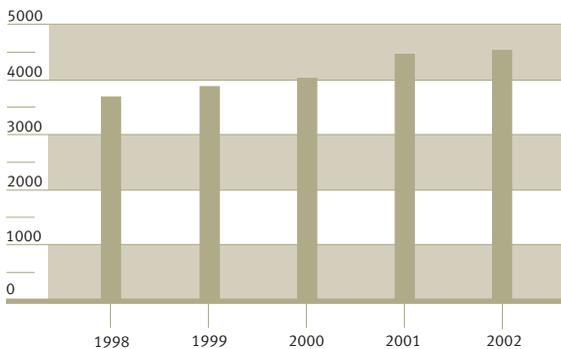
Strategies

- › Monitoring Commonwealth funding for postgraduate research programs
- › Ensuring Commonwealth authorities are informed of Queensland's needs for postgraduate research places

Universities are the key providers of training and professional development for our future researchers. Places in postgraduate research programs grew by more than 15 per cent in Queensland between 1998 and 2002 — see Figure 20. Despite a growth in places each year since 1998, Queensland is still disadvantaged compared to other states due to rapid population growth. The department will continue to represent the interests of Queensland, through national forums such as the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) and the Joint Committee on Higher Education, to increase the total pool of postgraduate research places available nationally.



Figure 20
Number of places in postgraduate research programs
1998–2002



Note: One place represents a full-time annual workload for one student. Excludes international students.

By being innovative, applying knowledge productively and exploiting the benefits of new ideas, we can ensure our state sustains long-term growth and remains competitive.

Remedial assistance allowed more than 3000 students from primary and secondary schools to develop a better understanding and application of key mathematical and scientific principles. The centres also developed specialist teacher training programs designed to stimulate students' interest in maths and science.

Online learning

The Schools of Distance Education developed online secondary school courses to ensure more students from regional and remote areas can pursue studies in maths, science and technology at higher levels. Courses available to students online include Certificate II in Information Technology, Science through Landcare, Information Technology Systems, Multi-strand Science and Maths in Real Life. Using the Learning Place website, science, maths and technology teachers developed online learning packages to extend curriculum options for students in remote areas.

Girls in maths and science

The Girls in Maths and Science Summer School stimulates girls' interests in maths and science and encourages them to study these fields in Years 11 and 12 and at university. Each year, between 70 and 100 students attend the annual school, with approximately 70 per cent being state school students. Students engage in a variety of hands-on activities ranging from agriculture, veterinary science, aeronautics and engineering. The summer school has been hosted by the University of Southern Queensland for the past 14 years and is supported by the department through the Maths, Science and Technology initiative.

Supporting teaching excellence

Scholarships to the value of \$24 000 each were awarded to five secondary school teachers of science to undertake overseas study in their chosen field. The scholarships acknowledge innovative science teaching practices that inspire students and colleagues, foster enjoyment of learning and support the Science State—Smart State initiative. The grants cover the costs of study, travel and other expenses, and are designed to strengthen each participant's knowledge of emerging international trends in their field.

Science, maths and technology

Strategy

Promoting science, maths and technology studies in schools

Science, maths and technology form the basis of Queensland's research priorities. Schools have a vital role in nurturing young people's interests in science, maths and technology. In 2002, 86 per cent of Year 12 students completed at least one science, maths or technology-based subject. The department aims to increase participation in these areas to 90 per cent by 2005. This year, Queensland state schools have set targets to help achieve this goal.

In 2002–2003, the following initiatives helped to achieve this goal.

Technology, Mathematics and Science Centres of Excellence

The operations of the eight Centres of Excellence were expanded to allow 10 349 primary school students and 7794 secondary school students to extend their learning in maths, science and technology. Residential workshops also provided opportunities for 176 outstanding students from primary and secondary schools in regional Queensland to extend their learning and interact with other students. [www](#)



Science State—Smart State initiative

The Science State—Smart State initiative was overseen by a steering committee with representatives from education systems, government departments, TAFE and universities, industry and unions. The initiative included 19 separate community forums and a Science Conference held in October 2002 to engage stakeholders in discussing key issues and developing proposals for the future enhancement of science education. This initiative culminated with the Science Summit in November 2002. Approximately 30 participants including representatives from government and industry, as well as scientists and science educators attended the summit to review proposals and issues raised throughout the Science State—Smart State initiative. A Statement of Action was developed through this forum, which contains recommendations for future policy consideration by government departments, education systems and industry. The statement provides an action plan for the future of science education in Queensland. www.education.qld.gov.au/sci

Outlook 2003–2004

The department will:

- › implement strategies from the Science State—Smart State action plan
- › enhance students' engagement in and enjoyment of science at school
- › complete an interim evaluation report of the Technology, Mathematics and Science Centres of Excellence by December 2003.

Schools have an important part to play in nurturing young people's interest in science.

Designer robots fascinate future engineers

Pine Rivers State High School physics teacher Dion Mumby had to look twice. After the last bell on the final day of term, half a dozen students remained in his classroom hard at work — and they weren't on detention. They were working on robots as part of a pioneering subject that has absorbed the school.

Robotic engineering is gaining popularity as a learning opportunity for both students and staff. The subject promotes team-based education and allows students with a variety of interests and abilities to pick their own challenges. Using advanced technology and design skills, students analyse complex technical problems and information in order to design, build and program robots to perform specific tasks.

Pine Rivers is the first school to introduce robotic engineering in Years 9 and 10 as a cross-curricular subject, taking in science and manual arts. In the next two years the subject will flow through to senior, another first for the state.

Export education: contributing to economic growth

Strategies

- › Supporting university courses of significant economic impact
- › Positioning Queensland as a national leader in exporting education
- › Enhancing Queensland's profile as a student destination and source of higher education and research expertise

Education contributes to the Queensland economy and employment as an industry in its own right, with international students contributing more than \$604 million annually to the economy. Combined export earnings across all sectors of education — higher education, vocational education and training, schools, and English language courses for overseas students (such as ELICOS) — make the sector one of the state's top-10 export earners.

Opportunities to extend international education opportunities are developed through the:

- › International Relations Unit — principally by developing international policy and protocols, and fostering government-to-government relations
- › Office of Higher Education — working cooperatively with Queensland's nine universities through the state's higher educational international initiative
- › Education Queensland International — working with Queensland state schools providing the International Student Program, educational study tours and consultancies.

The department is directly involved in the export of education by:

- › supporting the promotion of Queensland universities overseas
- › recruiting international students as fee-paying participants into 29 state schools
- › managing three Year 10 schooling programs through partner organisations in China
- › managing study tours for incoming groups of students and teachers involving more than 200 schools
- › providing professional education and systems development advice to overseas systems and governments
- › building government-to-government links and cultural exchange programs.

The department continues to work closely with Queensland Education and Training International — the operational arm of the Queensland Education and Training Export Board — to increase the state's export earnings from education studies and services.

There are approximately 1080 international students, originating from approximately 20 countries, enrolled in Queensland's state schools. Of this total number, approximately 560 are fee-paying. International students participate in a range of programs in state schools, including senior secondary courses, study abroad, ELICOS and study tours.

During 2002–2003 a total of 288 international study tours took place in Queensland state schools and international students and study tours generated \$8.2 million in revenue.

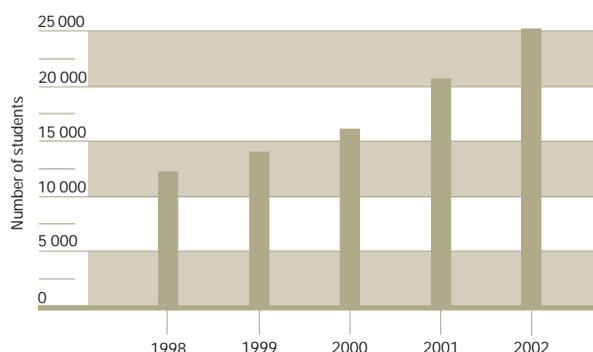
The latest available data for the higher education sector (including non-university providers) indicates that Queensland recorded the highest growth nationally in the number of international students, with an increase of 6048 from 2000 to 2001. During this same period, Queensland was the only state to significantly increase its national share of international students in higher education with 18.5 per cent.

In 2002, the trend for Queensland universities indicated that the state's position continued to strengthen with more than 25 000 international students, an increase of 55 per cent since 2000 — see Figure 21.

During 2002–2003, the department provided state advocacy to support the enrolment of more than 25 000 international university students from 140 countries. South Asia continues to be the number one source of overseas students with increasing numbers of students from Europe, Latin America, North America and the Middle East choosing to study at Queensland universities. Singapore (3557 students) is the number one source country followed by Malaysia (1952) and India (1787). China is continuing to show consistent and steady growth increasing from 1143 students in 2001 to 1525 students in 2002 — an increase of 33 per cent.

The department contributed \$0.48 million to the work of the Premier's Queensland Education and Training Initiative, which supports the education and training export industry in Queensland.

Figure 21
Number of international students in Queensland universities 1998–2002



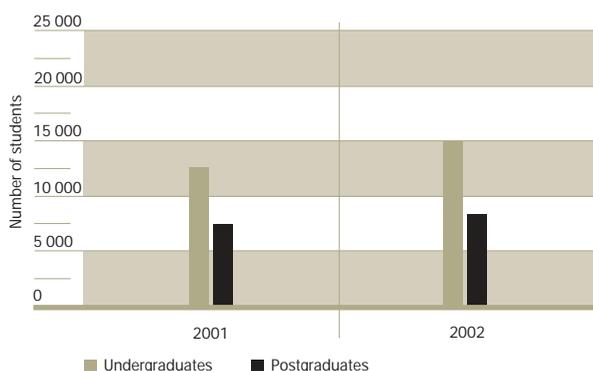
The department has furthered the state's strategic international links by facilitating:

- › a Ministerial delegation to China with a focus on quality assurance in higher education
- › memorandums of understanding on higher education cooperation with the states of Karnataka in India and Hessen in Germany
- › a memorandum of understanding on educational cooperation with the Consulate of Italy for Queensland and the Northern Territory
- › senior officials' visits from a range of countries including India, the Middle East, Java and Norway
- › the International Regional Heads of Education Forum, which brought together the education leaders of eight South-East Asian countries.

The majority of overseas students in Queensland universities are undertaking undergraduate degrees. However, increasingly Queensland is attracting international postgraduate scholars — 8331 students in 2002, which represented a 19 per cent growth compared with 2001 — see Figure 22.

During 2002, management and commerce, and information technology continued to be the most popular areas of study undertaken by overseas university students. Management and commerce attracted 34 per cent of all overseas students and information technology 26 per cent. However, the number of students undertaking health-related courses increased by 38 per cent in 2002, while the number of students undertaking education courses increased by 26 per cent.

Figure 22
Number of undergraduate and postgraduate international students 2001–2002



Outlook 2003–2004

The department will:

- › continue to increase the number of international students studying in Queensland
- › build strategic partnerships with overseas institutions, universities and schools, educational systems and governments
- › promote the engagement of state schools with international education
- › develop a departmental position on the internationalisation of Queensland education
- › develop Education Queensland International as a professional business operation.

Visit to China forges educational links

In November 2002, the Minister for Education led a senior delegation of Higher Education representatives to support and further develop the education relationship between Queensland and China.

The delegation also included the Chancellors of Griffith University and Queensland University of Technology (QUT), the Vice-Chancellors of QUT, James Cook University and Central Queensland University, as well as other universities, and senior officers from the Department of Education and the Department of Employment and Training.

The visit assisted Queensland universities to access the highest levels of Chinese Ministries of Education and Chinese Universities.