



ATSE

SUBMISSION TO THE

Department of Education and Training: Draft National Strategy for International Education

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Australian Academy of Technological Sciences and Engineering

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ATSE Submission

**Department of Education and Training: *Draft National Strategy
for International Education***

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The Australian Academy of Technological Sciences and Engineering (ATSE)¹ welcomes the opportunity to provide input to the Department of Education and Training Draft National Strategy for International Education. ATSE provides response to the call for input below.

Please outline your (or your organisation's) interest in Australian international education. Add any other relevant content.

ATSE's Fellows include some of Australia's leading thinkers in applied sciences, technology and engineering, drawn from academia, government, industry and research. The academy seeks to apply technology in smart, strategic ways for Australia's social, environmental and economic benefit. ATSE has a global perspective, recognising that technology, engineering and education operate across national borders. The Academy operates a number of international collaboration programs, including exchange programs for early career researchers and researcher-business partnership initiatives

ATSE runs the successful STELR (Science & Technology Education Leveraging Relevance) program to support STEM education in schools, and through its Education Forum seeks to promote best practice in school and tertiary level education in the STEM disciplines, and particularly in applied sciences, technology and engineering. A world-class education system for Australian students that attracts international students to Australian education is intrinsic to ATSE's mission.

ATSE's main objective for the proposed draft Strategy is for the continued successful operation of international education in higher education. There are already relatively high numbers and proportions of international students in undergraduate and postgraduate university qualifications in most STEM disciplines. Program providers with high proportions of international students (especially in Australia) are likely to concentrate their international strategies on improving quality rather than increasing numbers. The table below shows the numbers of students who graduated in 2013 from Australian higher education providers. The percentages are the proportion of international students in each cohort.

Program award	Natural & Physical Sciences	Information Technology	Engineering
Associate Degrees, Advanced Diplomas (AQF) and Diplomas (AQF)	81 (25.9%)	454 (62.1%)	537 (45.9%)
Bachelor Degrees	2,541 (14.8%)	3,163 (50.2%)	3,974 (36.1%)
Masters (Coursework)	836 (53.2%)	2,635 (78.1%)	2,403 (63.9%)
Higher Degrees by Research	683 (34.9%)	217 (60.6%)	691 (50.9%)

Source: Commonwealth Department of Education Higher Education Statistics 2013

Note: the numbers of graduates in the 'pathway' programs in the higher education sector are relatively small, but with significant proportions of international students (brackets). Providers may report these cohorts in different ways, and the numbers here may consequently understate actual totals.

¹ ATSE advocates for a future in which technological sciences, engineering and innovation contribute significantly to Australia's social, economic and environmental wellbeing. The Academy is empowered in its mission by some 800 Fellows drawn from industry, academia, research institutes and government, who represent the brightest and the best in technological sciences and engineering in Australia. The Academy provides robust, independent and trusted evidence-based advice on technological issues of national importance. ATSE fosters national and international collaboration and encourages technology transfer for economic, social and environmental benefit.

Does the vision statement in the draft strategy represent Australia's aspirations for international education?

The vision statement has aspirational elements, but could also be interpreted as representing the *status quo*. ATSE notes that the elements of the statement immediately provoke questions for the strategy, in terms of: quality (as in 'international standing'), relationships (as in 'social advancement'), economic value (as in 'prosperity'), and the extent to which international education is embedded into the education systems (as in 'core'). These features may differ with respect to how they should be actioned in the four educational sectors: higher education, vocational education, school education and English language training.

Are any significant goals for international education not adequately covered?

The goals broadly cover the required ground, especially for higher education. As for the vision statement, they raise questions of interpretation that may be different for each educational sector, and may differ between discipline areas. For example, in Goal 1 conflating 'the best in the world' with institutional rankings is not appropriate for the school and vocational sectors. Developing a specific set of goals and actions for each sector would have merit to reflect their different attributes and dynamics. ATSE has considered the document principally for its strategic value to higher education, as it is from this level that STEM-based careers are built.

Can you identify the strategic actions which best support your goals for international education?

The following comments apply to the higher education STEM disciplines. As noted above there are significant differences across the STEM disciplines, with respect to their engagement with international education. International students already dominate enrolments and graduations in all award levels in IT, in postgraduate coursework awards in all STEM fields, and in research degrees in engineering. Institutions are rightly wary of having classes composed almost entirely of international students, especially when these come from only one or two countries, as this diminishes these students' 'Australian experience'. At the discipline level, there are differences in the relative merit of the proposed strategic actions. Some of these are referred to below in comments on selected and grouped strategic actions, referenced on p13 of the consultation document.

Action	Comment
1.1	Excellence must be the <i>sine qua non</i> of the whole education system, but needs to be interpreted in broad terms, including access, as well as graduate achievement and satisfaction.
1.2 - 1.3	Continuing investment in staff, research training and equipment, is essential to achieve research excellence in technology and engineering across the university system (as well as in individual institutions), and measures of excellence (as used in rankings) need to be complemented by impact and engagement measures that relate to both national and global goals. ATSE encourages multidisciplinary research (such as that undertaken in CRCs) that addresses real and complex problems, but with outcomes that do not

	<p>necessarily fit simplistic research excellence metrics. (This issue has been addressed in ATSE's recently published Research Engagement for Australia report².)</p> <p>ATSE also urges investment, such as that provided by the Office for Learning and Teaching, to ensure that Australian universities, individually and collectively, score well on robust measures of teaching excellence, and student satisfaction.</p>
1.4	<p>Internal and external Quality Assurance processes are essential to maintain system integrity and reputation. There are widespread and public concerns about the English language standards of international students, reports of academic fraud amongst student groups, and questionable practices amongst a small number of private colleges operating in the VET sector. World class reputation is hard won, but easily lost. As also discussed in the Productivity Commission's report on International Education Services, ATSE urges consideration of rationalising the current multi-agency regulation arrangements into a common QA and Standards framework.</p> <p>ATSE also suggests that it would also be valuable for the government to encourage rationalisation of the nomenclature for university study and graduation (GPA) attainment. The current diversity of nomenclature must be challenging to prospective students. A review of the Higher Education Statistics collection categories to align more closely with current awards and discipline areas is also desirable.</p>
2.1 - 2.4	<p>There are already many institutional partnerships at university level in STEM disciplines, often built on links of academics who have migrated to Australia, and in higher proportions than non-STEM disciplines. The challenge is to deliver meaningful outcomes from partnerships. ATSE would urge identification and strengthening of the best links to be a priority, supported where possible by government to government links.</p>
3.1	<p>In general, engineering and technology graduates are prepared adequately for global work, as evidenced by the numbers who secure employment overseas after graduation. In addition, several Bachelor of Engineering (Honours) programs include intensive overseas visits and opportunities to undertake senior level project work in overseas companies. Some research centres systematically facilitate overseas study periods. ATSE strongly encourages these, and other study abroad opportunities, together with consideration for compensating students' loss of income whilst overseas.</p>
4.1 - 4.3	<p>Sound and honest marketing is essential, and must be based on excellence. In areas such as IT and engineering where postgraduate coursework enrolments (as a proportion of the class) are already very high, efforts may be needed to diversify recruitment.</p>

²ATSE (2015). Research Engagement for Australia: Measuring Research Engagement between Universities and End Users, Australian Academy of Technological Sciences and Engineering, available at <http://www.atse.org.au/content/publications/reports/industry-innovation/research-engagement-for-australia.aspx>

	This also relates to some of the Goal 5 actions to ensure international students gain an authentic Australian experience.
5.2	This action is strongly encouraged by ATSE. The provision of work integrated learning and work experience placements are critical issues for first-degree engineering, where most universities have program requirements for work experience. Such places are limited by cultural factors and misinformation, as observed in the consultation document, but also by absolute numbers of places. Studies on work integrated learning in STEM being undertaken by the Office of the Chief Scientist may inform the community on how to proceed to provide international students with high quality Australian workplace experience.
6.1	As observed in the document, Australia is somewhat ahead of many of our regional partners in adopting on-line educational methods. This is evident, for example, by some signatories of the Washington Accord agreement ³ not recognising engineering degrees delivered in external mode. ATSE would encourage our international partners to embrace new modes of delivery as our institutions demonstrate that they are at least as effective, educationally, as traditional methods.
6.2 -6.3	ATSE encourages expansion of opportunities for increasing Australian education services abroad, providing they are of the highest possible quality.

What are the best measures of success for international education?

All of the proposed measures listed in the consultation document have value. For the STEM disciplines in higher education, and based on current participation rates, ATSE would set the following seven priorities, based on elements in the lists at the end of each section of the consultation document:

- Strong and sustainable levels of investment in research and research infrastructure, leading in turn to higher performance in benchmarked institutional rankings.
- High levels of collaboration between Australian based and international private firms and universities in research.
- High levels of collaboration between Australian based and international private firms and universities for the provision of work integrated learning and work experience.
- Transparent and efficient performance of a rationalised quality assurance framework across all international education sectors to minimise the reputational damage to the whole system, arising from variable oversight and practices.
- For all international students, core measures should be graduation numbers, and high levels of satisfaction with their educational experience (e.g acquisition of graduate outcomes). For incoming students, an additional measure should be their personal experience (accommodation, sense of community, etc).

³ The Washington Accord agreement is between 17 international bodies responsible for accrediting professional engineering degree programs in each of the signatory countries. It recognizes the substantial equivalency of programs accredited by those bodies, and recommends that graduates of accredited programs in any of the signatory counties be recognized by the other countries as having meet the academic requirements for entry to the practice of engineering

- For all graduates, higher levels of English language competence and preparation for employment, at the applicable graduate, postgraduate or postdoctoral level.
- Increased numbers of students enrolling in study abroad schemes.

What are some case studies that best illustrate Australia's success? Please provide examples.

ATSE has administered several international exchange programs, predominantly focused on mid-career researchers (up to 15 years since their PhD), who have shown both technical expertise and leadership potential in science and technology. This directly relates to goal 2, pillar 2 of the vision statement illustrated in the draft strategy overview; building on Australia's strong education and research partnerships to broaden engagement

The Australian China Young Scientists Exchange Program (YSEP) is one example of ATSE, working closely with the Chinese Ministry of Science and Technology (MOST) and the China Science and Technology Exchange Centre (CSTEC) in successfully facilitating the exchange of researchers. Placement of researchers focuses on developing and strengthening personal research networks, investigating cooperative opportunities and exploring possibilities for shared research infrastructure between the two countries. Since 2006⁴ eight exchanges administered by ATSE (5 hosted by Australia, 4 hosted by China) have allowed 77 researchers (Australian & Chinese) to experience high level access to top scientists and institutions in each country. Further, the program to date has fostered the establishment of two joint Australia-China Centres, as well as generating a significant number of jointly authored papers and regular student and postdoctoral exchange. ATSE believes that the contacts made during the YSEP will ensure continuing cooperation between Australia and China at both the institute and research level, enabling joint research and development to maximise potential advances in science and technology.

To date, a total of 191 researchers, Australian and foreign, have been placed on exchanged through the five programs ATSE administers, with its partners:

- The Australia China Young Scientists Exchange Program
- The Australia Japan Emerging Research Leaders Exchange Program
- The Australia Singapore Emerging Research Leaders Exchange Program
- The Australia Korea Emerging Research Leaders Exchange Program
- The Australia Korea Early Career Researcher Exchange Program

What would you like to see progressed as a priority for the strategy in the first year?

The Strategy has a bold vision and operates across four educational sectors, with interests in incoming and outgoing students. All sectors are important to the Strategy; progressing each is a multifaceted task. For the higher education sector and STEM qualifications, a major current challenge is to capitalise on the lower Australian dollar by encouraging growth in the numbers of incoming students. The greatest scope would appear to be in the natural and physical sciences. For engineering and information technology, which already have high numbers of international students, the more pertinent issue is to increase quality. By

⁴ During 2012-2014 the program was not administered by ATSE, the figures presented only represent the total number of researchers exchanged through the Australia China Young Scientists Exchange Program while under the administration of ATSE.

being more selective, students will progress more rapidly, and will achieve stronger graduate outcomes. In principle, this should lead to better employment outcomes, stronger alumni identification and institutional reputation.

Is there anything else you would like to raise that will help develop the final National Strategy for International Education?

As stated earlier, within the framework of the Strategy there would be merit in developing separate goals and action plans for each of the four education sectors. The Strategy as presented concentrates strongly on higher education and the importance of research, even though research enrolments, for instance, constitute only a small proportion of the international enterprise. The Strategy understates actions and measures related to the vocational, schools and English language sectors. A priority could be to further elaborate these within the Strategy.