

APRU
IMPACT
REPORT
2016

APRU

Association of Pacific Rim Universities

Vision

Seeing the rapid economic integration of the region and the formation of APEC, the founding presidents' vision was to establish a premier alliance of research universities as an advisory body to international organisations, governments and businesses on the development of science and innovation as well as on the broader development of higher education. The vision now encompasses focusing new knowledge on the global challenges affecting the region.

APRU Members

Australia

Brian P. Schmidt AC, Vice-Chancellor and President, Australian National University

Glyn Davis AC, Vice-Chancellor and Principal, University of Melbourne

Michael Spence, Vice-Chancellor and Principal, University of Sydney

Ian Jacobs, President and Vice-Chancellor, UNSW Australia

Canada

Martha Piper, Interim President and Vice-Chancellor, University of British Columbia

Chile

Ennio Vivaldi Véjar, Rector, University of Chile

China and Hong Kong SAR

Xu Ningsheng, President, Fudan University

Tony F. Chan, President, Hong Kong University of Science and Technology

Chen Jun, President, Nanjing University

Lin Jianhua, President, Peking University

Qiu Yong, President, Tsinghua University

Peter Mathieson, President and Vice-Chancellor, University of Hong Kong

Wan Lijun, President, University of Science and Technology of China

Wu Zhaohui, President, Zhejiang University

Chinese Taipei

Pan-Chyr Yang, President, National Taiwan University

Indonesia

Muhammad Anis, Rector, University of Indonesia

Japan

Atsushi Seike, President, Keio University

Juichi Yamagiwa, President, Kyoto University

Shojiro Nishio, President, Osaka University

Susumu Satomi, President, Tohoku University

Makoto Gonokami, President, University of Tokyo

Kaoru Kamata, President, Waseda University

Korea

Jaeho Yeom, President, Korea University

Nak-in Sung, President, Seoul National University

Yong-Hak Kim, President, Yonsei University

Malaysia

Mohd Amin Bin Jalaludin, Vice-Chancellor, University of Malaya

Mexico

Salvador Alva, President, Monterrey Institute of Technology and Higher Education

Enrique Luis Graue Wiechers, Rector, National Autonomous University of Mexico

New Zealand

Stuart McCutcheon, Vice-Chancellor, University of Auckland

Philippines

Alfredo E. Pascual, President, University of the Philippines

Russia

Sergey V. Ivanets, President, Far Eastern Federal University

Singapore

Tan Chorh Chuan, President, National University of Singapore

Thailand

Bundhit Eua-arporn, President, Chulalongkorn University

USA

Thomas F. Rosenbaum, President, California Institute of Technology

John L. Hennessy, President, Stanford University

Nicholas B. Dirks, Chancellor, University of California, Berkeley

Linda P.B. Katehi, Chancellor, University of California, Davis

Howard Gillman, Chancellor, University of California, Irvine

Gene D. Block, Chancellor, University of California, Los Angeles

Pradeep K. Khosla, Chancellor, University of California, San Diego

Henry T. Yang, Chancellor, University of California, Santa Barbara

Robert Bley-Vroman, Interim Chancellor, University of Hawai'i at Mānoa

Michael Schill, President, University of Oregon

C.L. Max Nikias, President, University of Southern California

Ana Mari Cauce, President, University of Washington

Table of Contents

Executive summary.....	xi
Highlights.....	xi
1 Context	1
1.1 Introducing APRU.....	2
1.2 Asia-Pacific regional characteristics.....	2
1.3 Response to research & education conditions	8
2 Role and impact of APRU universities in the Asia-Pacific region	9
2.1 Educators and capacity builders	11
2.2 Creators and maintainers of knowledge.....	15
2.3 Applying research to societal challenges.....	18
2.4 Innovators and industry collaborators	22
2.5 Connectors and cultural bridges for the Asia-Pacific region	25
2.6 Agents of change.....	28
3 The contribution of APRU to response, recovery and disaster risk reduction	29
3.1 Context - the challenge.....	30
3.2 APRU research strengths - geophysical, meteorological & hydrological hazards.....	32
3.3 APRU activities & impact in disaster risk management.....	35
4 Identifying and reviewing strengths within APRU	39
4.1 Research.....	40
4.2 Innovation and innovation ecosystem strengths	44
5 Collaboration in the APRU network	45
5.1 Collaboration within APRU.....	46
5.2 Interdisciplinary collaboration.....	47
5.3 Summary	49
6 Appendix	50
6.1 Additional case studies	51
7 Data sources and references	53
7.1 Key data sources.....	54
7.2 Key reports.....	54
7.3 Endnotes.....	55

Executive summary

Purpose of the APRU Impact Report: This report provides for the first time the evidence base for the contribution of APRU's 45 member universities to their societies and to the key opportunities and challenges of the Asia-Pacific region.

Its purpose is to spotlight the competencies of the Asia-Pacific's leading institutions in education, research and innovation which have a direct relationship to these challenges. It also aims to demonstrate the value of international cooperation between universities and with international organisations, governments, NGOs, the private sector and local communities and thereby to identify the areas where future cooperation will have maximum impact.

Findings

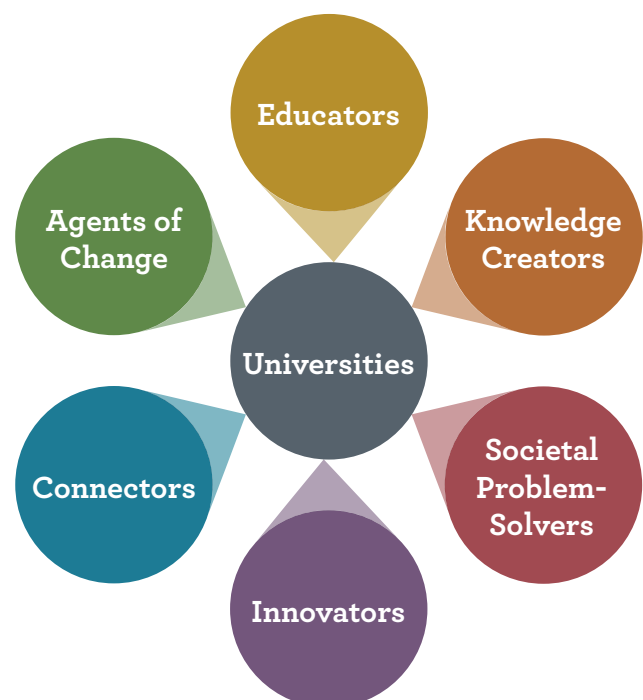
Drawing on the in-depth analysis that is now possible from mining huge research databases and from case studies, this report has found that APRU universities:

- exceed global and Asia-Pacific regional averages for performance in knowledge creation and research
- resource leadership in government, business and industry at high-levels with their graduates
- exercise extensive social influence across their societies through their alumni
- project impact nationally and internationally through their roles as educators, connectors, societal problem-solvers, innovators, agents of change, and knowledge creators
- bring the strength of diversity to solving global challenges
- boost the quality of research output through international collaborations
- act as international connectors and as a knowledge resource on a range of international challenges from disaster science to population ageing, from global health and the future of the digital economy to sustainability and climate change.

Highlights

Impact extends internationally

The impact of APRU institutions extends beyond the boundaries of the universities themselves to their societies and the Asia-Pacific region. The figure below captures the wide range of roles which produce this impact. More detail is provided in the report by means of quantitative analysis and qualitative case studies in Chapter 2. (Sections of this report are colour-keyed in the header according to the impact area matching the colours on the right.)



Knowledge Leadership

APRU institutions are thought leaders in their respective localities, punching above their weight in terms of research and creation of new knowledge across all metrics compared to world and Asia-Pacific regional averages (as demonstrated in Section 2.2, see page 16).

As educators, APRU institutions have produced successful graduates, including political leaders, Nobel Prize winners and business entrepreneurs (see Section 2.2).

These institutions continue to innovate through educational models which equip work-ready graduates for the future. Flexibility and success can be demonstrated through employer satisfaction and graduate employability (see Study 1).

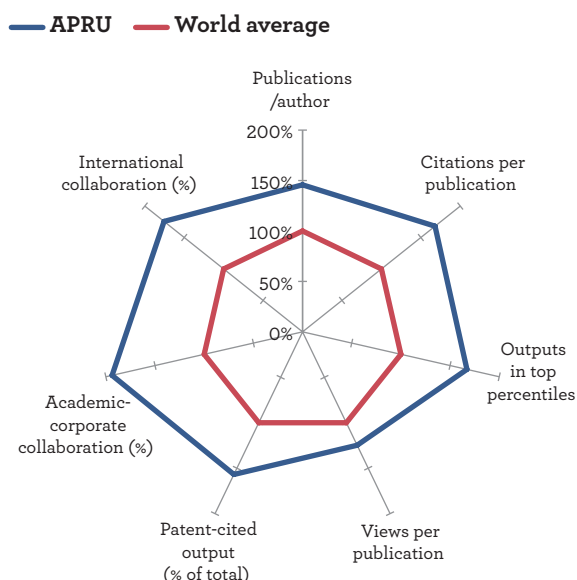


FIGURE from Section 2.2 – APRU research performance metrics relative to the world average (shown in red).

International Education

Education has become increasingly internationalised through international student flows and through the expansion of online education. APRU institutions show leadership in both areas: acting as physical educational hubs in the Asia-Pacific (page 25) and offering over 650 virtual programs (see page 11).

Societal Impact

APRU initiatives extend collaboration beyond the research realm, including sharing and applying knowledge to societal challenges as presented in various case studies throughout this report. APRU Research Programs in multi-hazards, population ageing, global health, the digital economy, sustainability and climate change have begun to demonstrate benefits for the region. Examples include sharing best practices for education of medical professionals (p 12), offering a forum for debate with industry on internet governance (p 27) or gathering data and policies on public health issues such as air pollution and water management (p 19).

Further examples of impact through current APRU activities can be found in case studies presented in the report, as well as in Chapter 3 focusing on multi-hazards and disaster management.

Connecting the Asia-Pacific region

Overall APRU researchers are highly collaborative, exceeding international and national collaboration rates compared to the world and the APEC regional average, and performing well compared with peer organisations (see Section 2.5 and chart repeated here).

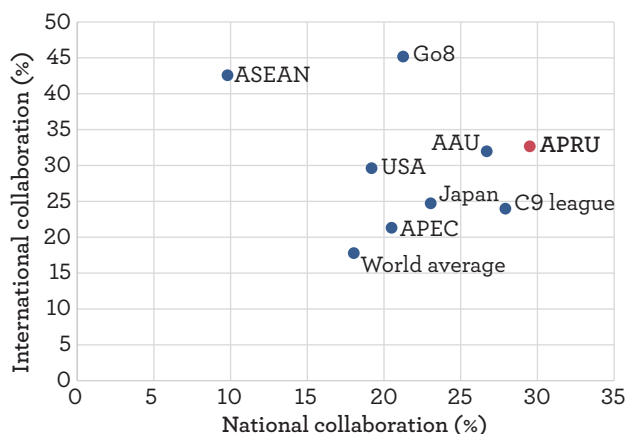


FIGURE 19 from Section 2.5, page 25.

Strength in diversity

APRU universities respond to a diversity of needs and environments, developing particular strengths and specialisations. Not all institutions focus equally on each of the areas listed above and, within a particular impact area or role, may choose different specialisations.

As a result, the network contains institutions that are both synergistic and complementary in terms of areas of expertise, thereby enabling collaboration of world-class experts within and across research specialisations, and providing a well-rounded overall research base (details can be found in Chapter 4).

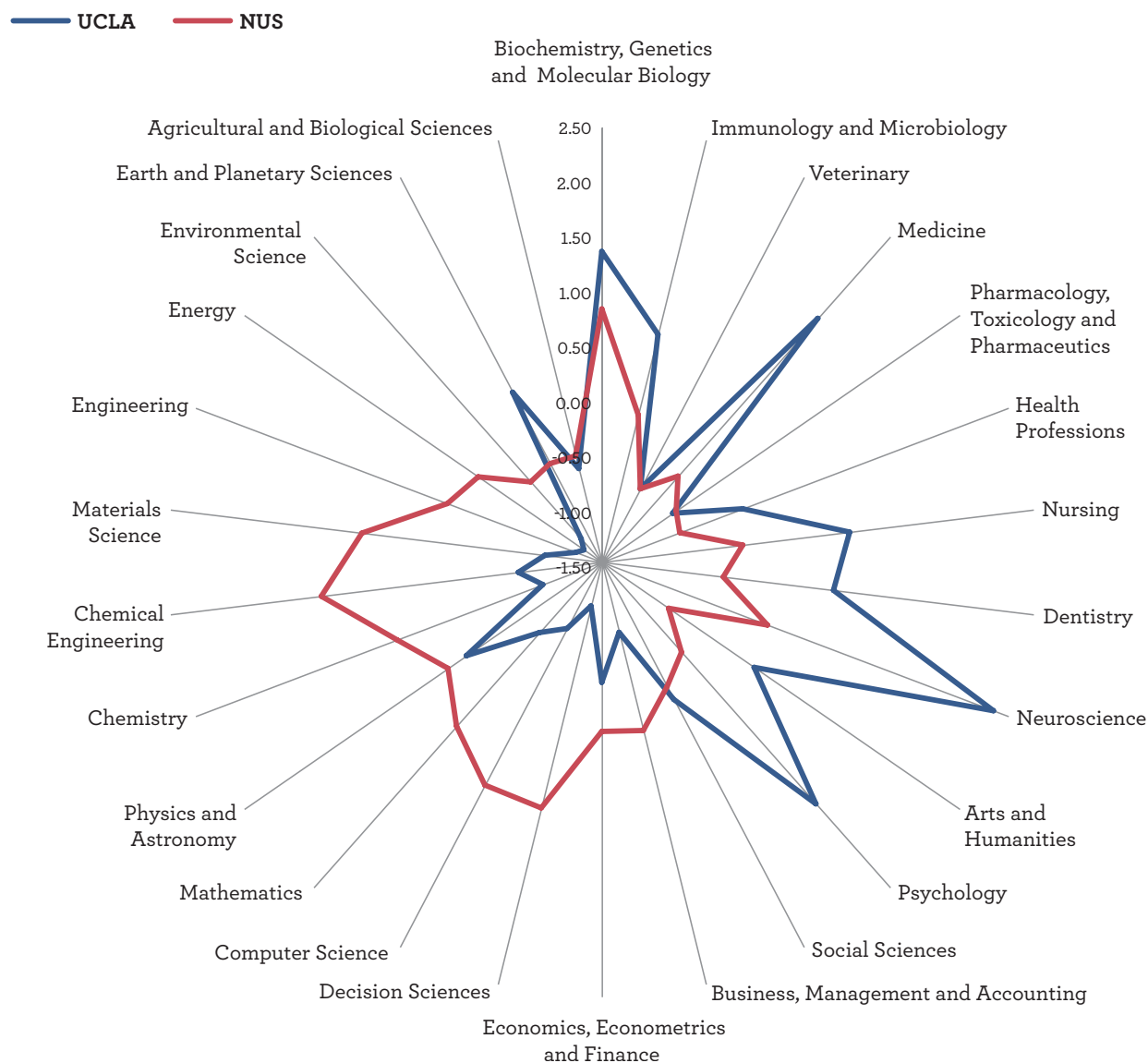


FIGURE from section 4.1.5 - Relative specialisation within APRU, by volume of output.

Collaboration enhances research quality

Collaboration within the network enhances research performance. Chapter 5 presents evidence that collaboration within APRU boosts citation rates of research, a commonly used proxy for measuring quality.

As a group in each discipline, APRU research has a quality index well above the world average, higher output volume is seen in disciplines related to Asia-Pacific regional challenges (such as earth and planetary sciences) and some areas of regional industry need (such as materials science).

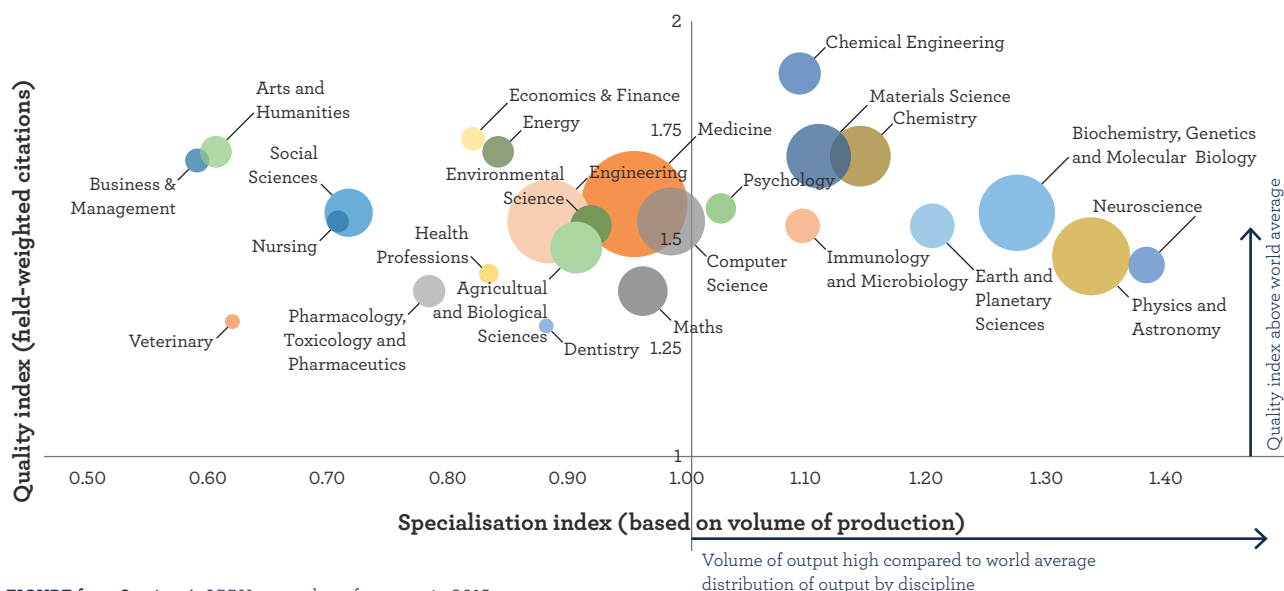


FIGURE from Section 4: APRU research performance in 2015

Report Structure

This report looks at the roles and contributions of APRU and its constituent institutions across the Asia-Pacific region. The emphasis is on recognising Asia-Pacific regional and local needs and identifying where universities have truly made and continue to make a societal impact.

CHAPTER 1

Provides context across the Asia-Pacific and for the economies in which institutions are situated. This provides background to understand constraints, challenges and opportunities that individual institutions are facing. It also offers an overview of diversity in of the region.

CHAPTER 2

Examines the different roles served by APRU and its institutions, considering their impact in each of these roles in turn through the use of case study examples.

CHAPTER 3

Focuses on how the work of universities translates to societal benefits in the context of disaster management.

CHAPTER 4

Considers specialisation across the institutions and areas of disciplinary strength for APRU, and how the different institutions within the network complement each other.

CHAPTER 5

Demonstrates how the network is stronger when it acts together by looking at collaboration and synergies between institutions.

Contributors

Data Partner and Sponsor:



ELSEVIER

APRU recognizes and appreciates Elsevier's contributions of its data, technical, and financial support that helped make this report possible. Elsevier is a world-leading provider of information solutions that enhance the performance of science, health, and technology professionals, empowering them to make better decisions, deliver better care, and make groundbreaking discoveries that advance the boundaries of knowledge and human progress. Elsevier provides web-based, digital solutions — among them ScienceDirect, Scopus, Elsevier Research Intelligence and ClinicalKey — and publishes over 2,500 journals and more than 33,000 book titles, including a number of iconic reference works. Elsevier is part of RELX Group plc, a world-leading provider of information solutions for professional customers across industries.

Report Development, Research and Analysis:

Kate Harland, Perspicuity Consulting, Canada

Perspicuity Consulting is a specialist consultancy, focusing on understanding and developing pathways to impact of research on society. Through transparent analytics and contextual framing we provide an evidence-base to assist decision-makers as they prioritise use of resources and seek to accelerate realization of benefits.

As lead author for this pilot report, Kate Harland brings experience of working with senior advisors and policymakers in Governments, science funding agencies, universities and private companies across the globe. Her work has spanned the UK, European Commission, New Zealand, Singapore, Israel, Ireland, Finland, Denmark and Canada. She also brings practical experience of the process of bringing new technology to market through development of multi-national research projects and field trials.

Report Design by:

Marten Sims, Beyond, UK

APRU

Association of Pacific Rim Universities

APRU International Secretariat

IAS Building, 3/F, 3019

The Hong Kong University of Science and Technology

Clear Water Bay

HONG KONG



apru@apru.org



apru.org



www.facebook.com/associationofpacifcrimuniversities



www.flickr.com/photos/apru



www.linkedin.com/in/aprusec

© 2016 Association of Pacific

Rim Universities Limited

Printed in Hong Kong

ISBN: 978-988-77283-1-3

(Hardcover)

ISBN: 978-988-77283-2-0

(Paperback)

NOT FOR SALE