Review of activities

2. Enhancing our high-quality research by improving our capacity to collaborate to achieve greater impact

While rightly proud of our research excellence, over the coming years we need to ensure that our research remains collaborative and continues to achieve great impact. To succeed in our focus areas of leading healthy lives, building better bioeconomies, achieving resilient environments and livelihoods, designing technology for tomorrow, and transforming societies, we will be outwardly focused, while at the same time working across disciplines internally.

Key performance indicators
Research impact

An increase in normalised citations

An improvement in our global reputation

Times Higher Education Academic Reputation Survey results[1]

	2017	2018	2019
Research reputation votes: UQ rank within Go8	4	5	6

Category Normalised Citation Impact (CNCI) score[2]

	2013	2014	2015	2016	2017	2018[3]
UQ's rank within Go8 for CNCI score	2	2	2	4[11]	6	6
UQ's Go8 rank on the proportion of publications that sit in the top 10 per cent globally[4]	2	2	2	2	3[11]	5

Rank in the top three in Australia on national competitive grants income

Competitive Grants Category 1 research income[5]

	2013	2014	2015	2016	2017	2018
UQ's national rank	2	2	2	2	2	2

Rank in the Top 65 global universities across all influential rankings

UQ's position in global university rankings

	2015	2016	2017	2018	2019	2020
Academic Ranking of World Universities (ARWU)[6]	77	55	55	55	54	n/a
Times Higher Education World University Ranking[7]	65	=60	=60	65	69	66
QS World University Ranking[8]	=43	=46	=51	=47	48	47
Performance Ranking of World Scientific Papers[9]	45	43	41	43	40	n/a
U.S. News Ranking[10]	47	52	52	45	42	42

[1] Source: *Times Higher Education* Datapoints.
[2] Source: Incites Dataset within *Web of Science* and is based on a rolling six-year window; the document types included in this metric are Article, Review or Conference Paper.
[3] Figures for 2019 are preliminary. Data will be finalised in mid-2020.
[4] Based on performance around citations; source *Incites*.
[5] Source: Department of Education.
[6] Source: Academic Ranking of World Universities.
[7] Source: *Times Higher Education*.
[8] Source: Quacquarelli Symonds.
[9] Source: National Taiwan University.
[10] Source: *U.S. News*.
[11] Change in previously reported figures due to change in methodology, and based on data for citations that continue to accrue (based on data over a six-year window).

2.1 Build a One UQ approach to acquiring, maintaining and utilising research infrastructure.

Research infrastructure and project management framework
Following the establishment of the Central Research Platforms in 2018, and the research framework for supporting high-end infrastructure and equipment, a Project Governance and Management Framework was created in 2019 to provide governance, assurance, monitoring and oversight of UQ's project portfolio. To date, a plan has been developed to improve research infrastructure with a focus on Physical Containment Level 3 laboratories, clean rooms, bioproduction and accreditation of services. A 'One UQ' Research Infrastructure Investment Scheme was launched to encourage the purchase of equipment that will be used collaboratively. UQ Gatton also had a redevelopment plan drawn up that will allow a range of new assets to be incorporated, such as research cropping field equipment and two crop-testing fields.

Research Capability Showcase
2019 saw the launch of a unique platform where UQ research capabilities were showcased with their leading-edge research initiatives, services and impacts. The day included 11 themes, more than 50 presentations, 20 infrastructure facility tours and workshops, and dozens of capability displays. The day was instrumental in attracting industry partners and stakeholders to UQ.

▶ Related initiative for 2.1	
5.2 IT governance	pg 30

2.2 Actively encourage internal collaboration between researchers from different disciplines and organisational units.

Research networks
Greater collaboration across and between different disciplines and organisational units allows our researchers to better tackle the increasingly complex challenges facing society and requiring multifaceted solutions. In 2019, under the newly revised UQ Institutes, centres and research network policy, the frameworks for Transdisciplinary Impact Research Networks and Capacity Research Networks were advanced.

The October addition of research networks to the People, Planning, Performance dashboard has facilitated UQ-affiliated academics who have not yet collaborated to connect with each other based upon their shared interests. The tool uses a topic modelling algorithm to build interactive visualisations of UQ's existing and potential research collaboration networks.

Research Week
2019 Research Week provided an opportunity to celebrate and connect UQ researchers and showcase their research achievements. Highlights included the:

– Research Awards Night, which recognised high-calibre researchers for their outstanding contributions to research excellence, partnerships and HDR supervision
– Research Capability Showcase
– inaugural Aboriginal and Torres Strait Islander Research Forum, which featured an expert panel discussion on the topic of 'Partnering for Impact'
– launch of UQ Industry Connect
– UQ Three Minute Thesis competition.

▶ Related initiatives for 2.2	
1.4 Science Precinct	pg 18
3.4 CX program	pg 25
4.3 Internal research schemes	pg 27

2.3 Actively pursue strategic and high-quality international collaborations in research and education.

The University of Queensland – Indian Institute of Technology Delhi Academy of Research (UQIDAR)
In 2018, UQ and the Indian Institute of Technology (IITD) formally established the Academy of Research (UQIDAR), with the aim of leveraging shared capabilities, resources and expertise across industry, government and academia between nations. The key feature of the partnership is a joint PhD program involving all UQ faculties and research institutes, with scholars spending time at each institution. In 2019, UQ worked with schools, institutes and the Graduate School to enrol UQIDAR's second and third PhD student cohorts (now 30 students in total), who are undertaking research in multidisciplinary areas including exploring the potential of health-tech startups in India, the impacts of changing flood characteristics on river morphology, and the health benefits of air-pollution mitigation.

UQ–University of Exeter (QUEX)
UQ continued working with the UK's University of Exeter to develop postgraduate study and collaborative research opportunities. Working under the overarching banner of 'Global Sustainability and Wellbeing', the Institute focused on three interdisciplinary themes in 2019: environmental sustainability, healthy ageing, and physical activity and nutrition. In 2019, the partnership funded eight new QUEX Initiator and four new Accelerator grants (bringing the totals to 18 and eight respectively), 10 new PhD scholarships (bringing the cohort to 20), and 10 Professional Services Fellowships. UQ also hosted the *QUEX International Symposium: Fostering global sustainability and wellbeing* in July.

▶ Related initiatives for 2.3	
3.1 Partnerships Committee	pg 23
6.3 Enhancing capability	pg 33

2.4 Actively encourage researchers to partner with industry, government and the community both within Australia and internationally.

Research partnerships
UQ's flagship research partnerships include Boeing, The Dow Chemical Company, Siemens, Baosteel, Rio Tinto, HBIS and Pfizer. In 2019, UQ worked closely with the Academy of Humanities, Wageningen University Research, CSIRO Agriculture and Food, KPMG, Reef Restoration and Adaption Program, Mining3, Mining Equipment Technology and Services (METS) and the Agrifood/Energy/Advanced Biomanufacturing: Toowoomba Innovation Precinct.

Launch of UQ Industry Connect
This new initiative was launched during Research Week 2019 and created a pathway for creating strategic industry-UQ partnerships by ensuring that industry has access to a simple, coordinated entry point to support collaboration discussions and interaction with UQ's wide range of expertise and infrastructure.

Dow Centre partnership
Throughout 2019, the UQ Dow Centre continued to make strong progress across its research themes, which span energy transitions, low-carbon energy and materials, and the circular economy, including multiple collaborative research projects with the Fight Food Waste Cooperative Research Centre (CRC), the Future Fuels CRC, the Flexible Printed Batteries CRC-P, and the Andlinger Center For Energy And Environment at Princeton University to progress our Rapid Switch project. The UQ Dow Centre also appointed the inaugural Tritium Fellow in E-Mobility, a prestigious research position focusing on advancing the performance, economics and uptake of electric mobility.

▶ Related initiatives for 2.4	
1.1 Entrepreneurship Strategy	pg 16
6.2 New opportunities	pg 33

Many UQ staff were recognised for their contributions to research at the 2019 Research Week award ceremony held at Customs House in September.

Student Nathaniel Deering working in the Centre for Solid Waste Bioprocessing, which undertakes research and development into organic waste recycling and identifying novel markets for waste organic materials.

2.5 Develop a more consistent approach to higher degree by research (HDR) training with a focus on ensuring students build research, transferable and professional skills.

UQ Industry PhD partnerships

The Graduate School provides strategic HDR scholarships to facilitate greater connectivity and involvement between HDR candidates and industry partners. Projects are designed in partnership with industry and involve a cohort of students working on projects that are aligned with the interests of the industry partner and are consistent with an engagement and impact agenda. Building on the existing partnership with Boeing, further partnerships with Newcrest, CSIRO and Ecotourism Australia were developed this year, providing HDR candidates with the opportunity to work on a program of industry-led research with associate advisers from industry, collaborative funding arrangements, and opportunities for placement and embedded experiences.

Career Development Framework (CDF)

The CDF was expanded in 2019 to include research development activities for enhancing the project design/data analytical capabilities of students. This was designed in partnership with faculties, institutes and HDR candidates.

Higher degree by research (HDR) industry placements

2019 was a big year for HDR placements with a considerable increase in demand from candidates. The Graduate School organised more than 76 placement opportunities, including five under a new partnership with APR Intern this year. Placements were undertaken within government, industry and the not-for-profit sectors and provided HDR candidates with an opportunity to further develop and translate their transferable skills.

Career development mentoring

The purpose of the HDR Career Development Mentoring Program is to provide HDR candidates with the opportunity to engage with professionals working in diverse industries (including academia) to investigate career pathways and gain exposure to different perspectives and advice when considering their broader professional and career development. The initial pilot ran over 12 weeks in two phases and included 15 pairs. After revising the pilot's report form, further iterations of the program will be run in 2020 after some adjustments have been made.

Three Minute Thesis (3MT)

2019 saw the 3MT competition continue to grow with African nations Uganda and Zambia joining the 3MT family, along with the first West Indies country, Saint Kitts and Nevis. 3MT is now at more than 600 universities in more than 85 countries globally. UQ's own competition was strongly contested in 2019, its twelfth year. Medical student **Cody Frear** won with his presentation *Negative pressure wound therapy in paediatric burns: no-no or Noo-Noo*. Cody also won first place in the Universitas 21's 3MT competition. Another 3MT competitor, **Rhys Pirie**, went on to win the Falling Walls competition in Berlin.

2.6 Invest in the development of systems and processes for the storage and publication of research data, including the capability for this to benefit future researchers.

UQ Research Data Manager (UQRDM)

Sustained growth continued in the world-leading UQRDM project, part of the Research Management Business Transformation program. UQRDM integrates working data storage, and delivers researchers and HDR students an automated platform to appropriately and securely store, share, re-use, collaborate on, and manage their projects' research data.

Key progress indicators included the launch of Digital Research Notebooks and delivery of a pilot-completed integrated Datasets feature into UQ's publications repository, UQ eSpace.

▶ Related initiatives for 2.6	
5.1 Conflict of Interest	pg 30
5.3 Research Management Business Transformation program	pg 31

2.7 Develop flexible models to effectively utilise the institution's intellectual property.

UniQuest

UniQuest continued to impress in 2019 as Australia's leading university technology transfer company.

A potential therapy targeting difficult-to-treat immune system disorders such as rheumatoid arthritis will progress to clinical trials in 2020, after securing $20 million in Series A funding from UniQuest's licensing of the intellectual property rights.

UniQuest also negotiated a licence agreement with Australian Stock Exchange-listed environmental management technology firm Envirosuite for the SeweX technology, developed by researchers from UQ's Advanced Water Management Centre.

JKTech

As the technology transfer company for the University's Sustainable Minerals Institute (SMI), JKTech provides technical consulting and training services in drill and blasting, geometallurgy and minerals processing, laboratory services, specialist testing equipment, specialised ore characterisation tests and simulation software products. Significant activities and achievements during 2019 included:

– JKTech's team completing client work in more than 15 countries

– rolling out of a new blast movement model (JK Value Based Ore Control) across 18 Rio Tinto global mine sites: JKTech is commercialising this model from SMI research

– JKTech team members working within the CRC ORE (Cooperative Research Centre – Optimising Resource Extraction) team to co-develop Grade Engineering® as a commercial product: JKTech aims to commercialise this technology after the conclusion of CRC ORE II

– JKTech being finalists in two categories at the 2019 Premier of Queensland Export Awards (Professional Services, and Mining, Energy and Related Services).

3. Building engaged and strategic partnerships with a broad range of local and global networks

Engaging and collaborating with the community, industry, government and other research innovators is critical to UQ's capacity to meet the rapidly changing needs of society. We aim to enhance our approach to external engagement with a partnership framework, customer relationship management system, deeper international connections, diverse income sources and ongoing commercialisation interests.

Key performance indicators
Partnerships

Rank first in Australia for attracting research income from industry

UQ research income[1]						
	2013	2014	2015	2016	2017	2018
UQ's national rank on research income from industry	2	1	2	2	1	2

An increase in the proportion of our publications that are co-authored with external international or industry partners

UQ publications with external co-authors[2]						
	2013	2014	2015	2016	2017	2018[3]
UQ's rank within the Go8 for the percentage of publications with an international co-author	6	4[4]	6	6	4	3
UQ's rank within the Go8 for the percentage of publications with a non-academic co-author	5[4]	5[4]	5[4]	5	5	5

[1] Industry includes research income from the following sources: non-Commonwealth schemes, rural R&D, Australian and international organisations, and Cooperative Research Centre (CRC) R&D income received from non-government sources.
[2] Source: Incites Dataset within *Web of Science* and is based on a single full year only; the document types included in this metric are Article, Review or Note.
[3] Figures for 2018 are preliminary. Data will be finalised in mid-2020.
[4] Change in previously reported figures due to change in methodology, and based on data for citations that continue to accrue (based on data over a six-year window).

In May 2019, UQ representatives visited the University of British Columbia (UBC) in Canada to discuss partnership options. Pictured from left: UBC Director of Global Partnerships Emily MacDougall, Professor Bruce Abernethy, UBC Vice-Provost (International) Dr Murali Chandrashekaran, Professor Neville Plint, Dr Jessica Gallagher, Professor Vicki Chen, UBC President Professor Santo Ono, Professor Peter Høj, AC and Professor Stephan Riek.

3.1 Build a centralised resource to support, develop and manage significant partnerships guided by a clear partnership framework.

Partnerships Committee

Following the introduction of a Partnership Framework that adopts a 'One UQ' approach to the development of strategic industry partnerships, work continued in 2019 on its refinement. Building on the current Partner Engagement Strategy for international higher education institutions, the new framework seeks to ensure a more coordinated approach to building and strengthening collaborations with industry partners and ensuring that UQ maximises opportunities for the whole institution. For UQ's valued industry partners, the framework will streamline the process of engaging with UQ (particularly with first contact), support delivery of services, and ensure that UQ provides a comprehensive, consolidated offering to match each partner's unique needs. Under the new framework, a Committee was established to help coordinate activity related to UQ's strategic industry partnerships.

Hospital and health services

The Faculty of Medicine began a dedicated campaign to strengthen its relationships with Queensland Health across the state to explore mutually beneficial avenues for supporting clinician research.

Research partnership model

The research partnership model (RPM) has been very successful in supporting UQ to lift its performance in securing industry funding. However, the model is under strain due to its high workload and so work began in 2019 on the development of a new model to augment existing resources.