



QUT's Science and Engineering Widening Participation Program

Building aspiration for STEM tertiary studies and increasing student diversity

Annual Report 2018

About our program

The QUT Science and Engineering Faculty (SEF) Widening Participation (WP) Program works with under-represented school groups to build aspiration for university study, particularly in the fields of STEM.

Our primary focus is to counteract financial or social disadvantage and demystify the university experience for students who attend low socioeconomic schools, especially in non-metropolitan areas. Many of these students would be the first in their family to attend university.

We create transformational moments-keeping alive students' love of learning. We reach students at a critical time in their lives where we can affect real change.

The feedback from students, teachers, parents and our ambassadors is overwhelming. Each year we play a significant role in supporting students, teachers and schools to reach their potential and dream bigger.

The program is a QUT Widening Participation initiative funded by the Australian Government's Higher Education Participation Partnerships Program (HEPP).



2018: A Year in Review

In 2018 QUT's Science and Engineering Widening Participation Program engaged over 20,000 students with in-school activities (17,134), and on-campus activities (3,181), a 12.7% increase compared to 2017.

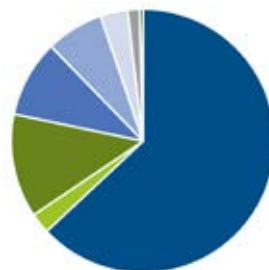
More than 66 ambassadors were employed over the course of 2018. We delivered more than 460 curriculum aligned workshops across 37 target low-SES schools in Caboolture and Brisbane north regions.

We supported high schools in hosting Transition Days for 1,900+ year 6 students, to get them excited about studying STEM subjects in high school.

We provided STEM taster activities for 2,500+ students across 96 workshops for QUT's Explore Uni program.

More than 500 students were involved in our annual STEM events including the Power of Engineering, Science and Engineering Challenge, Go for ITgURL, AMSI Choose Maths day and the STEAM Experience day.

In addition to the HEPP funded program SEF Widening Participation ambassadors engaged with another 4,600+ students through QUT community events.



20,000+
students engaged

In school activities

- **Van Workshops (63%)**
12,800+ students
- **Transition Days (9%)**
1,900+ students
- **STEM Events (7%)**
1,400+ students
- **School-Led Activities (3%)**
680 students
- **STEM Futures (1%)**
290+ students

On campus activities

- **Explore Uni (13%)**
2,500+ students
- **STEM Events (3%)**
500+ students
- **Oodgeroo Unit (>1%)**
85 students

A blue car is shown from the side, featuring a large white 'extreme science' logo. Above the logo is a graphic of a hexagonal molecular structure in red and orange. Below the logo is a black swoosh and the QUT logo. At the bottom of the car, it says 'a university for the real world®'. The background is a green and blue geometric pattern.

In-school workshops

In 2018, over 12,600 students participated in more than 460 workshop sessions. These were presented to target equity schools in North Brisbane and Caboolture regions.

New workshops and experiences in 2018

Each year we update our workshops based on teacher feedback, school curriculum and changing needs. In 2018 we added the following new workshops focusing on Mathematics, Digital Technology and Urban Development:

Carnival of Maths (year 7)

Students used well-loved carnival games to learn about estimation, probability, statistics and profit/loss.

Alien World (year 8)

Using genetics and probability, students investigated strange alien creatures to determine how their features and reproductive patterns determined their chances of survival.

Predator vs Prey (year 9)

Students discovered population change over time as a result of survival and ecological balance.

Create a City (year 7)

Students explored interconnections between people, places and the environment. They considered environmental, economic and social factors as they worked together to design and build their own 3D city. This workshop explores concepts of urban development and links to sustainability and geography curricula.

VR and Coding Experience

(year 7 to 10)

Developed and delivered by students from QUT's Games Development Club with support from the SEF Widening Participation Program, the VR and Coding Experience helped students understand how VR games are built and gave them the opportunity to code their own games.

Workshops for 2019

In 2019 we plan to develop and trial new workshops exploring physical properties and gravitational influences of space and our solar system. We will also be extending our offerings in Digital Technology to align with the Digital Technologies curriculum.

“ The content was highly relevant for year 8's. The QUT student ambassadors were excellent; well-informed and patient. Students were engaged in each activity. ”

Murrumbidgee State Secondary College





Events

Moreton Bay STEM Fest

The annual Moreton Bay STEM Fest is coordinated by teachers from Murrumba SSC, Deception Bay SHS, and Burpengary SSC, and supported by QUT's SEF Widening Participation Program. The Widening Participation team worked with teachers and participating schools to help provide students with the skills and confidence to undertake different project ideas over an 8 week period. SEF WP support included 2 days of in-school workshops, ambassador mentoring sessions and judging at the final showcase event.

Reach: 120+ students and 15 teachers from Murrumba SSC, Deception Bay SHS, Burpengary SSC, North Lakes SC, and Pine Rivers SHS.

STEM Futures

Tailored to students needs, SEF Widening Participation ambassadors visited schools to talk about subject selection, uni, and career aspirations. Ambassadors also delivered hands-on workshops in their field of study.

Reach: 290+ students participated in STEM Futures at Bray Park SHS, Bribie Island SHS and Tullawong SHS.

The Science and Engineering Challenge

The Science and Engineering Challenge is a nationwide STEM outreach program delivered by the University of Newcastle and hosted by QUT. Year 9 and 10 students experienced aspects of Science and Engineering which they would not usually see in their school environment. QUT's SEF WP Program supported schools from Caboolture and Brisbane north region to attend the event. Each of the eight event activities were run by SEF WP ambassadors.

Reach: 190+ students from Burpengary SSC, Caboolture SHS, Dakabin SHS, Deception Bay SHS, Morayfield SHS, Murrumba SSC, Narangba Valley SHS, and Pine Rivers SHS.

Go for IT gURL

This is an annual event that partners QUT academics with student ambassadors to deliver information technology activities to Year 9 and 10 students. This year QUT Games Development Club delivered a virtual reality workshop for students and SEF WP ambassadors delivered Spheros coding workshops.

Reach: 30 students from Caboolture SHS and Morayfield SHS.

Power of Engineering

Power of Engineering aims to inspire young people to consider a diverse and creative career in the profession of engineering, with a particular focus on females, regional and Indigenous students. At this full day event year 9 and 10 students heard from inspiring guest speakers working in the field of engineering; experienced hands-on workshops; and visited organisations including Qantas, Defence Australia, Thiess, Arup and Lendlease. The SEF WP Program supported schools from Caboolture and Brisbane north region to attend this event.

Reach: 70+ students from Aspley SHS, Bribie Island SHS, Clontarf Beach SHS, Redcliffe SHS and Woodford SS.

Transition Days

Transition days provide the opportunity for students in upper primary school to visit local secondary schools, to discover what studying STEM subjects in high school can offer. The widening participation team provides ambassadors and STEM workshops at these events to help inspire students to study STEM in high school.

Reach: 1,900+ students participated in transition days at Bray Park SHS, Deception Bay SHS and Tullawong SHS.

AMSI Choose Maths day

Hosted at QUT, the Australian Mathematical Science Institute Choose Maths event aims to empower students, particularly girls and women, to pursue a career in mathematics. Students attending the event heard from motivational speakers and participated in hands-on workshops. SEF WP ambassadors delivered mathematical workshops.

Reach: 80+ students from Aspley SHS and Bray Park SHS.

Explore Uni

Schools are invited to bring their students for on-campus experiences which aim to demystify university and TAFE as post-school options. Each on-campus day and camp includes a range of talks, hands-on activities and role model interaction to dispel some of the myths about university and TAFE. SEF WP Program supported Explore Uni days by providing STEM workshops and SEF WP ambassadors.

Reach: 2,500+ students across 96 workshops.





STEAM Experience Day

In 2018 we partnered with QUT Precincts to deliver the inaugural STEAM experience day at QUT.

The event created space for students to explore nature's biodiversity and botanical structure from perspectives of both art and science highlighting the shared processes of creativity, critical thinking, problem-solving, communication and collaboration within both areas.

Reach: 120+ students from Kilcoy SHS, Murrumba SSC, Narangba Valley SHS, and Pine Rivers SHS

“ Each workshop integrated ideas of science and art. We learnt that people can be creative in science and practical in art. ”

Jess and Xana,
Pine Rivers State High School

Students participated in:

Immersive art experience and artist talk-

Artists-in-residence Man and Wah Cheung produce botanically inspired works exploring themes of biodiversity and cosmic existence which celebrate the beauty and diversity of nature from around the world.

William Robinson gallery tour-

An art student and a geology student took students on a tour of this exhibition. Students looked at the incredible Australian landscapes through these two filters.

Vascular system participatory workshop-

Using stereo microscopes students explored the beauty, patterns and visual splendour of nature seen through science and art.

Art as knowledge nature

journaling workshop- Students learned about the history of the world through the documenting process of art and science.

“The event inspired us to collaborate more. We are planning to use the creative processes experienced at this event to help our students explore and communicate their different ideas”

Kerrie Smedley,
Head of Science,
Murrumba State Secondary College



“

Thank you to the wonderful work of the ambassadors leading our *Budding Geologists* workshops and *Meet the Scientist* sessions. Their contribution to the program was a real highlight! They communicated their scientific knowledge and encouraged even the littlest of our visitors.

”

Public Programs Officer,
The Cube, QUT Precincts



Student ambassadors

The employment of students as ambassadors is a key enabler of STEM engagement. STEM ambassadors at both undergraduate and postgraduate level provide an extremely important voice for, and connection into, STEM at QUT.

Ambassadors are able to share their experiences, including the challenges and opportunities that they have encountered to break down barriers and misconceptions, and help grow aspiration amongst the next generation for a University STEM education as an achievable and attractive pathway.

This has proven to have impact in encouraging students who might be first-in-family, from identified socioeconomically disadvantaged catchment areas or simply who do not have family connections to STEM professionals, to see

the potential for themselves to undertake STEM studies.

The ambassador program provides the opportunity for QUT students to meet like-minded people, engage with the faculty, and deepen their discipline knowledge through teaching others.

This year our ambassadors represented QUT at a number of key events including:

- TSXPO
- Open Day
- Real World Futures conference
- Take to the Skies (Boeing events)
- QUT International tours
- Australian Centre for Robotic Vision (ACRV) tours
- The CUBE holiday program

The SEF Widening Participation Program engaged QUT student clubs including:

- Engineers without Borders
- GEMS (Girls in engineering making statements)
- QUT Robotics Club
- QUT Game Development Club

Student Ambassaor Alumni Achievements in 2018

We keep in touch with many of our ambassador alumnus through LinkedIn. Here is what some achieved in 2018:

Adam Tow, robotics software lead at Dorabot, named one of Forbes China 30 under 30 in 2018.

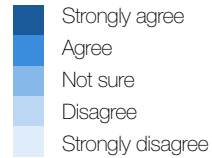
Kelvin O'Shea featured in "Careers in STEM" magazine for his work as sole product designer at TANDA.

Steve Liddell featured in QUT Links Alumni magazine for developing the Street Science program. Considered Queensland's number one provider of science engagement activities, Steve was also invited to present at New York's World Science Festival in 2018.



Feedback

In response to SEF WP Program in-school workshops

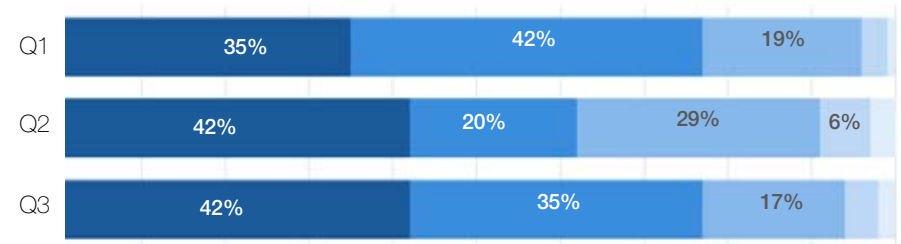


Student's responses years 5-7

Q1 Today I've learned about future jobs and study options.

Q2 After today, I think uni could be in my future.

Q3 After today, I'm motivated to do my best at school.

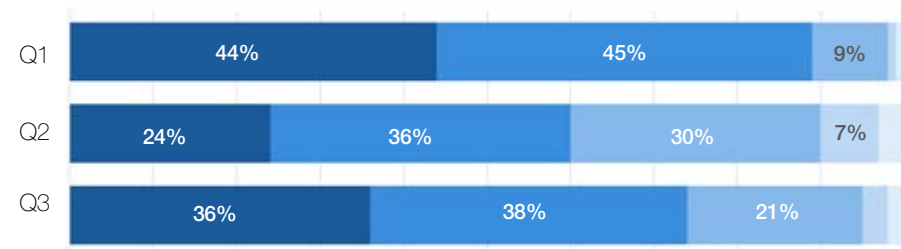


Student's responses years

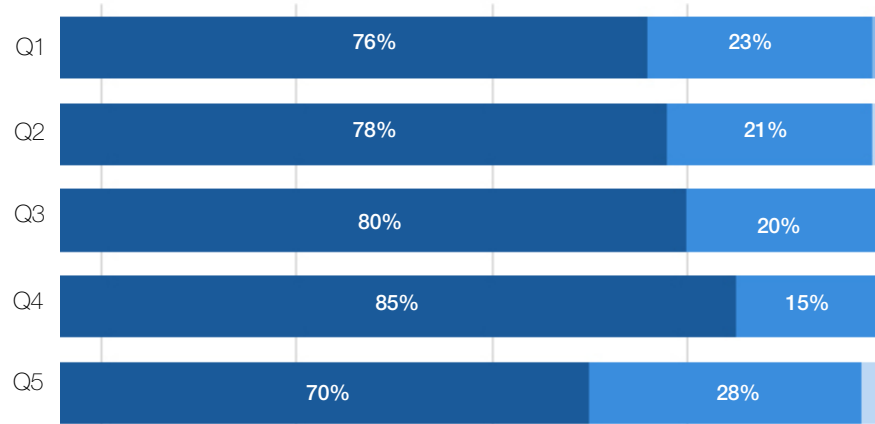
Q1 Today, I've learned that uni can lead to a range of jobs and study options.

Q2 Today has stimulated further interest in further study or training after school.

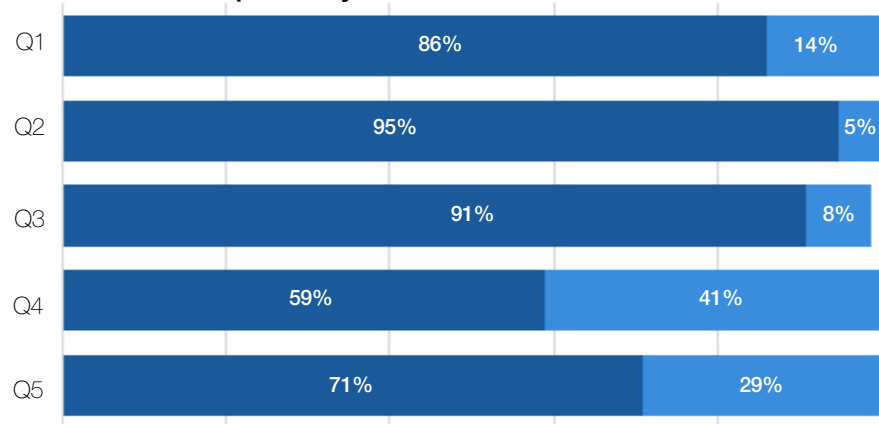
Q3 After today, I'm motivated to do my best at school so that I have choices when I leave.



Teacher's responses years 5-7



Teacher's responses years 8-12



- Q1 Activity and resources were of a high standard
- Q2 Content was relevant to the school curriculum
- Q3 Content and delivery style was appropriate to the students' year level
- Q4 Students were interested and engaged
- Q5 Workshop contributed to students' understanding of STEM-related tertiary study/ careers





Future Directions

In 2019 we will continue to deliver quality educational and engaging workshops, events and activities to under-represented school groups to help build aspiration for university study.

We have plans to further enrich the program with the following:

Grow our partnerships with QUT's Faculty of Health and QUT Precincts to deliver collaborative events.

Work more closely with schools with high indigenous populations.

Strengthen partnerships with Oodgeroo unit. Explore the possibility of delivering a STEM day camp.

Apply for funding to create a STEM peer-to-peer mentoring program for WP students in years 11 and 12. Mentors would include SEF WP ambassadors, and student club members (e.g. GEMS, WIT and EWB).

“ A fantastic and relevant experience for students. An essential part of the unit that engages student in ‘real’ science ”

Caboolture East State School

We wish to thank the following staff who have supported the SEF Widening Participation Program through their engagement and

Professor Margaret Sheil, Karen Whelan and Gordon Wyeth
(Guest speakers at the Science and Engineering Challenge)

David Lovell and Stephen Kajewski
(Judges at the Science and Engineering Challenge)

Troy Farrell
(Keynote at AMSI Choose Maths day)

Erin Peterson
(Keynote and judge at Moreton Bay STEM Fest)

Michael Milford
(Keynote at the Murrumba Maths Tournament)

We wish to thank the following supporters of the SEF Widening Participation Program



Donation in honour of
QUT 2018 Outstanding Alumni



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