Engineering a Diverse Future
11- 12th October 2018

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

University Collaboration Workshop 2018

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Executive Summary

CONTEXT

The way in which Australian and New Zealand universities communicate to collaborate and share strategies about Women in Engineering (WE) affects the initiatives that are implemented at each university. As a result, it is vital for true transformation to take place that knowledge and experience is shared. In October 2018, The University of Queensland (UQ) organized a two day collaboration workshop for WE hosted at the RMIT campus in Melbourne.

With 28 people in attendance, which included delegates from universities across the South Pacific and industry representatives, the aim of the workshop was to understand gender equity programs and work collectively to design a strategy which identified further opportunities to increase female participation in engineering studies focusing on three key areas – Student Engagement, Teacher Engagement, Collaborate and Connect.

KEY ISSUES

During discussions and consultation with each other at the workshop, it was stated that some initiatives which were implemented did not have the desired outcomes. These include but are not limited to the following:

AREA	ISSUE
Student Engagement (Prospective and Current)	Prospective students are mainly influenced by their parents and not being able to reach students who need the specific information as well as ignoring parents as an audience can cause resistance by those female students wanting to study engineering courses. With social pressure, stereotypes and the perception of studying MATH courses, a larger number of female students enroll into health related courses.
	Not having consistent communication and the lack of importance given to first year lectures and group dynamics can leave female students feeling isolated.
Teacher Engagement	There is a perception from teachers that indicates teachers not wanting to be taught due to time constraints and non CPD accredited activities.
Collaborate and Connect	A high turnover rate for Women in Engineering roles, conflicting agendas as well as tertiary institutions competing for students can sometimes be a roadblock to collaborate and connect with each other.

NEXT STEPS

As a group, we have identified four ‘quick wins’ that will generate high value return and improvements to the attraction and retention of female students into engineering programs.

1. Marketing/Branding - To improve the perception of engineers, it is vital to alter and market the brand/image of an engineer to include female engineers, both office and site based and to move away from the traditional ‘hard hat’ images. Furthermore, the need to collaborate the message to cater for a larger audience by working together with key messages and themes that are deemed to be successful will have a wider impact. Articulating that engineers rise to leadership of major enterprises must be conveyed more effectively as well as the diverse range of skills such as teamwork and communication that can be gained from an engineering degree.It is anticipated that specifically, the emerging engineering disciplines, including in bio-engineering and sustainable

engineering, will favour the interests of more women, however, this should not limit marketing to only these disciplines. Outreach activities need to span all stages of school education, as stereotypes are formed very young, primary school years.

2. Mentoring Programs - Mentoring programs and consistent communication with current female students assists with the feeling of belongingness, generally not felt by female students in male dominated degrees.
3. Teacher Education - Development of teacher resource packs which not only is a catalyst for promoting the engineering profession, but also educate teachers about current entry requirements and an updated description of engineering degrees. A second societal issue is to address gender issues, including prejudice and unconscious bias in classrooms (at all levels of education) and in workplaces.
4. Connect and Collaborate – As a group, connecting, collaborating and contributing ideas with each other and getting industry involvement through a shared platform of resources will help universities boost their own ‘Women in Engineering’ Programs.

Objectives

The main objectives of the workshop were:

- Develop an understanding of existing gender equity education programs and recruitment initiatives targeted at increasing participation of females in engineering studies across each of the universities.
- Identify further opportunities to increase female participation in engineering focusing on three core areas student engagement including prospective and current, teacher engagement and collaborate and connect.
- Support a collaborative approach and work collectively to create a strategy to meet our long term objectives and overall increase female participation in engineering studies across Australia and New Zealand while including industry within the process.

Expectations

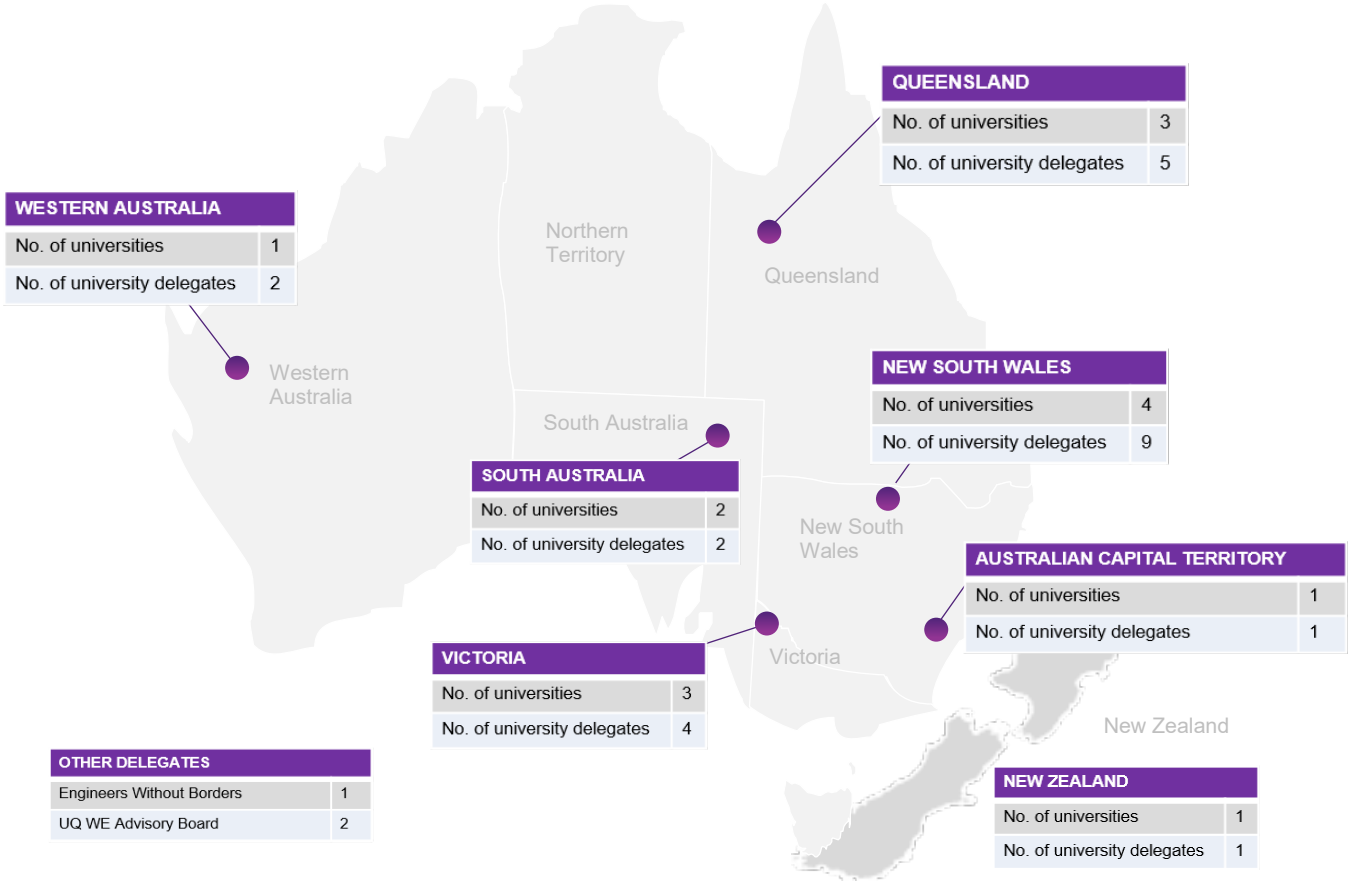
The expectations of the workshop were to:

- Identify a collective voice and build a one page strategy for increasing female participation in engineering studies.
- Identify a framework for the key focus areas which can be taken to universities/organisations.
- Leveraging industry into long term strategies for the future.
- Build a platform to share ideas and data to collaborate and connect.
- Discuss lessons learned and best practice methods for each focus area.

Attendee Map

Below is a map of where the attendees came from.

We would also like to acknowledge the venue host of the 2018 University Collaboration Workshop RMIT, Melbourne.



QUEENSLAND	
No. of universities	3
No. of university delegates	5

WESTERN AUSTRALIA	
No. of universities	1
No. of university delegates	2

NEW SOUTH WALES	
No. of universities	4
No. of university delegates	9

SOUTH AUSTRALIA	
No. of universities	2
No. of university delegates	2

AUSTRALIAN CAPITAL TERRITORY	
No. of universities	1
No. of university delegates	1

VICTORIA	
No. of universities	3
No. of university delegates	4

NEW ZEALAND	
No. of universities	1
No. of university delegates	1

OTHER DELEGATES	
Engineers Without Borders	1
UQ WE Advisory Board	2

Focus Area One: Student Engagement

Table 1: Prospective Students

	Best Practice
Marketing	• Mastering subtle marketing –using trigger words that create emotion and focus on the 'how' engineering can help the world. *Refer to Trent Leggatt from the University of Queensland presentation for examples.* • The importance of the names of the degree – 'medical engineering' for example and the connotations that come with it. • Having a dedicated program – Women in Engineering. • Focussing on social impact in presentations – climate change, pollution, water etc. and market it around how engineers can make a difference. • Language – communicating skills of an engineer as everyday tools like communication, problem solving and teamwork. • Using role models and creating a desire through empowerment.
On Campus Activity	• STEM holiday camps – also involving parents and teachers. • Using other University Societies to communicate the common message. • Educating the importance of diversity and gender balance in the industry.
High School Outreach	• Hands on activities/ videos. • Primary school engagement. • Female only audiences (resonates better with girls- higher interactive rate). • Multiple touch point approach - longer process but better results. • Student Leaders presenting at their own schools – relationship already there. • Making sure content links to school curriculum. • Attending subject selection nights.
Industry Engagement	• Career Nights • Bringing industry representatives on school visits.

What is not working?

The workshop provided an opportunity for university delegates to share lessons learned and what hasn't work. They included:

STEM Star Portal.	Social pressure and stereotypes.	Issues with the perception of MATH (general vs. advanced).	Preaching to the converted.	No Follow Ups.
The long term commitment of primary school and the difficultness in measuring the results.	Duplications of initiatives.	Not using the right talent.	Free events can cause drop offs.	Not able to reach students that need us and ignoring parents as an audience for the prospective students.

Table 2: Current Students

	Best Practice
Marketing	• Flexi first year courses. Attracting from other disciplines like health. • Relevant and contextualised communications (personalisation). • Data analysis to highlight trends and find links on results of students who participate in programs to those who don't.
On Campus Activity	• Providing a sense of community through 'physical space' • Student leader programs focusing on belonging, personal skills and professional. • Peer to peer mentoring. For example first years with final years. • Inviting male students to events. • Linking male students with female mentors. • Academic accreditation for undertaking mentoring. • Asking students what they want and need and delivering these items. For example having current student representation at the next Collaboration Workshop. • Training on how to call out inappropriate behaviour – diversity training for current students.
Industry Engagement	• Industry mentor programs. • Real Work Achievements and academic acquisitions. • Empowerment programs – using industry as role models. • Supporting students through the lifecycle of their career with continued relationships and alumni contacts. • An opportunity for networking and enhancing employability skills. • Diversity awareness training – workshops with industry.

What is not working?

The workshop provided an opportunity for university delegates to share lessons learned and what hasn't work. They included:

Issues with only reaching one audience.	Timing of mentor sessions and events due to the student's busy schedules.	Importance of first years, lecturers and group dynamics.	Under resourced.
Continued communication needed with current students.	The students who prefer to be referred to as engineers and shut off during 'women in engineering' dialogue.	The issues with how we communicate – group dynamics (then shy students don't speak up) where one on one is time sensitive.	How to include male students within the process.

Focus Area Two: Teacher Engagement

Table 3: Teacher Engagement

	Best Practice
Marketing	• Understanding the importance of teacher involvement in student's subject and student's career choices. • Marketing material and resource packs for teachers making the process easy to implement. • Use of communication.
High School Outreach	• Demystifying engineering – including teachers in the activities/co-learning. • Two way communication – understanding what activities they want and delivering.
On Campus Activity	• Teach the teachers – presenting at teacher conferences, network events and associations. • Focus groups and Personal Development days. • Work with Career Guidance Officers too. • Working with the next generation of teachers. • Unconscious bias training for teachers.
Collaboration	• Collaborate with education faculty to create content to teach the teachers. • A scholarship opportunity for an engineer to study a teaching degree. Create ex engineers into teachers. • Online courses and resources for teachers. • Accredited training to understand STEM career pathways.

What is not working?

Issues with duplicated repetitive programs and activities.	Career guidance officers not educated in 'what engineering is'.	High turnover of teachers.	Adhoc engagement not attached to a strategy and the lack of representation.
Superficial engagement.	Implications and time restraints on being able to reach teachers.	Non CPD accredited activities.	Retired engineers aren't becoming teachers and therefore not represented.

Focus Area Three: Collaborate and Connect

Table 4: Collaborate and Connect

	Best Practice
Industry Focus	• Joint partnerships, mentoring, alumni, internships and networking events. • Sponsorships, site visits. Assist industry to connect with students. • Limit the multiple contact points for industry to make it an easier process. • Joint industry university events – joining funding with certain activities and marketing it as a package. • Involve industry in student's transition from university to careers. • Bring industry to school visits. • Arrange industry funded camps.
Connect	• Online forum, sharing industry partners details. • The importance of handover between people when switching roles. • Connecting with student groups together. • Connecting with Engineers Australia and NZ on a group scale. • Create a Not-For-Profit (NFP) group, LinkedIn group to share ideas and concepts, live contact list, Google drive, Dropbox or file sharing. • Share success stories. • Create a template of each model for each university- state wide approach, live forums, commonly asked questions in a shared document. • Connecting with other STEM groups to gain a bigger, more collective voice. • Meet more often – every second year, we invite teacher and student representatives. • A national day for engineering (unite effect). • Group evaluation tools, outreach activities. • Sharing outcomes – learning outcomes, shared vision, shared research – for example on male engagement. • National survey on first year students and what initiatives have worked and not worked. • Common national response to backlash/bad PR. Unify our message as a group. • International research to learn best practice and practice methods. • Collate data per state and compare.

	• Creating a spreadsheet of good industry contacts/presenters to share. • Create sub committees and roles and teleconferences more often. For example every few months.
Strategies	• Changing the marketing collectively and creating a united message for consistency and greater success. • Look at the international market for best strategy. • Sharing success stories to leverage of one another where deemed relevant. • Survey and focus groups and sharing the findings. • Equity and diversity training resources • Working with male students and sharing the research findings.

Roadblocks

In some cases, a high turnover rate for Women in Engineering roles.	Conflicting agendas – wanting to work together as well as competing for students.	Evaluation – how hard it is to measure (especially if programs start primary school engagement).	Hard to measure success short term.

Women in Engineering - Strategy on a Page

Note – the size of the bubble indicates the level of effort required to implement the activity/initiative

Appendix

Table 5: Attendee List

Name	Title	University	Email Address
Alana Harries	Student Recruitment Manager	Monash University	alana.harries@monash.edu
Louise O'Reilly	Marketing Engagement and Recruitment Manager	University of Adelaide	l.oreilly@adelaide.edu.au
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Alison Stoakley	Engineering Education	Engineers Without Borders	a.stoakley@ewb.org.au
Lucy Marshall	Associate Dean for Diversity and Inclusion	University of New South Wales	l.marshall@unsw.edu.au
Mike Griffin	CEO and UQ Women in Engineering Advisory Board Member	API	mcgriffin@caloundra.net.au
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