WREN
WOMEN'S RESEARCH ENGINEERS NETWORK

EVALUATION REPORT 2022

Partners and Funding Agency:

UNIVERSITY OF WOLLONGONG AUSTRALIA

USP MULHERES

USP Universidade de São Paulo

Coalar
Council on Australia Latin America Relations

1. DEFINE

PROBLEM What issues does the program address?

The barriers to women's STEM career progression result in high rates of attrition. This is particularly acute in engineering research and academia where women are still in the minority, leading to the diminishment of women's voices in leadership and decision-making. Worryingly, the current inequality in academia is being exacerbated due to the impact of COVID-19 in certain groups including female researchers. It appears that women are submitting fewer papers [1] and the subsequent countermeasures for COVID-19 (such as lockdowns) have increased women's family responsibilities disproportionately [2]. Furthermore, lower social capital in their fields [3] and lack of collaboration opportunities impede women's visibility and success rate in attaining continuing sources of funding to support their careers.

AUDIENCE	GOALS Specific-Measurable-Achievable-Relevant-Time specific		
Program participants The program is aimed primarily at early-mid career women engineers working in research, but membership of the network is not restricted to gender nor field (open to any who are allies to reduce gender inequality in STEM) and welcome postgraduate students **Evaluation audience** Women in STEM/EDI initiatives from the partner universities. Other individuals or groups seeking to do similar activities. Our funding body (COALAR), others government funding bodies and universities leadership.	**Outcomes (short term <1 y)** • Build a network between Australia and Brazil women engineering researchers • Run 5 online events to raise awareness of gender EDI issues, share cultural differences and exchange common experiences • Provide website as store of knowledge • Develop online collaboration database	**Outcomes (medium term 2-4 y)** • Database widely populated by members • Receive feedback on improvements • See the fruits of collaboration (e.g. joint papers, teaching and proposal writing) • Expand to other geographical locations • Identify ongoing structure and sustainment initiatives • Gain reputation for successful collaboration • Support others in Gender Equity efforts	**Impacts (long term 5+ y)** • Network is self-sustaining • Network grows and develops as the needs of those within it evolve • See long-term collaborations • Become well-known in engineering research field with proven outcomes/success reputation • See an increased representation of women in engineering in all career levels

2. PLAN

ACTIVITIES		EVAL. PRIORITIES	KEY QUESTIONS	INDICATORS
Activities Participants will attend WREN online events to improve their knowledge of women in STEM issues. The first three events build on knowledge and awareness, leading to a networking workshop and practical career development workshop. Participants will seek out collaboration opportunities with other network members.	**Inputs** Access to populations of women engineering researchers Support from decision makers at partner universities **Outputs** Website Final Report with Evaluation Marketing materials and social media presence	**1-3 priorities for evaluation** 1. Evaluate the current women in engineering issues in the partner countries 2. Identify potential areas of collaboration (via SDGs) 3. Collaboration outcomes	**What questions will eval. answer?** 1. Uncover the true trends from partner universities. 2. Where are the opportunities for collaboration? 3. Determine whether the network is providing a platform for collaboration. How many collaborations were established? How many proposals were submitted through the WREN?	**What demonstrates the outcomes?** 1. Comparative study that is then accepted by the partner universities. 2. Representation of women in the network solving problems across the UN SDGs. 3. New contacts made, joint proposals, writing or teaching, hits on the website, member raised calls for collaboration and answers to calls for collaboration)

3. DESIGN

DESIGN APPROACH	METHOD	DATA COLLECTION TOOL
Series of surveys of attendees to see how trends/usefulness changing Collation of comparative data from enrolment and employment trends	Mixed method surveys post-events Qualitative survey for input to drive network aims/knowledge needs Comparative evaluation of quantitative data around women in STEM at the partner universities Demographic questions as per ABS groupings	Collect data on event registrations and attendance Post-event surveys Planning surveys for website content and network capabilities Data from partner universities around their women in engineering quantitative data

1 Problem

There has been increased awareness of the gender gap in academia, especially in Science, Technology, Engineering and Maths (STEM) fields. Nevertheless, the change to address this gap happens slowly and inequality continues to persist. Three specific factors that contribute to increasing gender inequalities in STEM are:

1) Women are less likely to achieve a greater social capital in their fields, in other words, supportive professional networks are limited [3].
2) In engineering, men are more likely to be awarded grants and receive higher amounts of funding [4] and one of the existing gender gaps reflects that women researchers have fewer international collaborations compared to their male peers [4].
3) Women are submitting fewer papers due to COVID-19 pandemic [1] and the subsequent public health measures (such as lockdowns) have increased women's family responsibilities disproportionately [2]. The COVID-19 crisis has also disrupted travel to traditional face-to-face conferences, which is an important mechanism to spark international collaborations.

2 Audience

The main audience of the Women's Research Engineers Network (WREN) is women in engineering, more specifically early-mid career engineering researchers and PhD students, and is not limited to only women.

The WREN was launched in April 2021 and relied exclusively on funding from Council on Australia Latin America Relations (COALAR). The funding was allocated as part of the COALAR 2020-21 Special Grant Round focused on COVID-19 and economic recovery using digital technology platforms to strengthen links between Australia and Latin America.

3 Goals

In the long-term, the WREN aims to narrow the gender gap felt by women in engineering careers. The WREN will achieve this by supporting women in engineering throughout their academic careers by fostering international collaborations, which are closely linked to successful grants and promotions, and promote more fruitful academic environments for career development.

In its first year (**short term outcome**), the WREN aimed to establish as a network, build its website, promote research by women engineers, and foster initial collaborations. **In the medium-term**, the WREN will see a further expansion of the network and development from its short-term outcomes through more collaborations and sustainable input from its members. The WREN also aims to increase the awareness of leaders to implement policies that support women in their academic careers and see an increased women participation in engineering in all career levels.

4 Activities

A series of online events as webinars and workshops were held throughout 2021 to establish the network and engage with women in engineering researchers in Australia and Brazil. The events were not restricted to only women and welcomed all genders.

Event 1: Research Engineering in Australia & Brazil – Connecting and collaborating to shape the future
The WREN's inaugural event was held on the 25th of May 2021. The purpose of the event was to introduce the educational system of each country and present current collaborations and future opportunities.

Event 2: Gender Equity - Fostering Success for Women in Engineering
Held on the 29th of June 2021, the event raised awareness of the gender gap in engineering and showcased women initiatives within the organisations. The data showing the disparity of women in engineering was summarised and presented earlier in this report.

Event 3: Research & Teaching Networking – Sparking Collaborations for a Sustainable World
Held on the 31st of August 2021, the purpose of this event was to learn how to align research and teaching activities with the United Nations Sustainable Development Goals. The event was held as a seminar and networking.

Event 4: Feminisms – Why engineers (and everyone) should care?
Held on the 31st of August 2021, the webinar was opened by opening of the seminar had the distinguished participation of Prof. Patrícia M. Davidson, Vice-Chancellor of the University of Wollongong, and Prof. Vahan Agopyan, President of the University of São Paulo. During the lectures, sociologists from both universities spoke about how feminisms impacted and continue to impact societies.

Event 5: Career Development – Creating Your Roadmap to Career Success
This workshop was held as two parts over 2 days; 1st and 2nd of December 2021 and was facilitated by international higher education career development professional, Dr Shelda Debowski. This event was open to academics and postgraduate students from universities across Australia and Brazil.

Alongside the events, WREN has worked hard to establish visibility through its online presence through social media channels and marketing and create the website.

5 Evaluation

The online events engaged with a total of over 250 women engineering researchers in Australia and Brazil. Key outputs of the project were new connections formed between event attendees, through grants proposals, a map of potential collaboration and teaching opportunities built by WREN members through workshopping, and a website that will enable members to post, view and build further collaborative relationships.

The WREN Evaluation Report communicates the key findings from the project. This report will be submitted to university decision makers and the funding body and is awaiting official release. The report will be published on the WREN's website and shared with stakeholders and the funding body.

The WREN has actively shared the foundations of the network, individual events and outcomes in several media outlets:

Online articles

International Day of Women and Girls in Science, UOW Research and Innovation Magazine, Feb 2022
A guerra contra o gênero, Jornal da USP, Oct 2021
Mulheres nas áreas STEM da USP e a busca pela equidade, Jornal da USP, Sep 2021
Rede australiana de engenheiras convida para quarto seminário online "Feminisms: Why engineers (and everyone) should care!", Universidade Federal de Ouro Preto, Sep 2021
Reitor participa de evento promovido por rede internacional de pesquisadoras em engenharia, Jornal da USP Sep 2021
Tackling gender inequality through a global pandemic, UOW Research and Innovation Magazine, Sep 2021
Engenheiras debatem oportunidades no ensino e na pesquisa que promovam mundo sustentável, Jornal da USP, Aug 2021
Introducing WREN – connecting women engineers in Brazil and Australia, UNSW Women in Maths and Science Champions Program Blog, Jul 2021
Seminário internacional debate iniciativas para igualdade de gênero na engenharia, Jornal da USP, Jun 2021
UOW female engineers network aims to close gender gap, boost opportunities, Illawarra Mercury, May 2021
Engineering better opportunities for women, UOW Universe, May 2021

Broadcasting media

UOWTV Interview – Link
ABC Illawarra Radio Interview - Link

Academic and industry dissemination

- IEEE NSW Women in Engineering Affinity Group
- INCOSE Empowering Women Leaders in Systems Engineering (EWLSE)
- Paper presented at '*I Congresso USP de Cultura e Extensão*' in 2021
- UGPN Conference March 2022 – Women in STEM Panel to be hosted by the WREN

The WREN committee has submitted proposals to three other grants:

1) Australia-ASEAN 2021 round. This project aims to expand the WREN to ASEAN.
2) Teaching & Learning UOW internal grant. This project aims to integrate female role models into the engineering curriculum. First and second year students will be exposed to successful female engineers (alumni, local and international participation).
3) National Science Week 2022 Grant. This project's goal is to encourage high school students from regional schools to participate in STEM activities and, through a strong female representation, aims to inspire girls to enter a pathway into STEM. It is a collaboration between the WREN and the Industry 4.0 Hub, UOW.

Another proposal involving the University of São Paulo was selected in the Women in Science: UK-Brazil Gender Equality Partnerships Call by The British Council. The WREN seminars, as well as other USP initiatives, helped to increase the visibility of women researchers in the STEM fields and highlight this gender gap, inspiring new proposals for broader gender equity.

6 References

[1] Kitchener, C., *Women academics seem to be submitting fewer papers during coronavirus. 'Never seen anything like it,' says one editor., in The Lily. 2020: https://www.thelily.com/women-academics-seem-to-be-submitting-fewerpapers-during-coronavirus-never-seen-anything-like-it-says-one-editor/.*
[2] Nash, M. and B. Churchill, *Caring during COVID-19: A gendered analysis of Australian university responses to managing remote working and caring responsibilities.* Gender Work Organ, 2020. **27**: p. 833-846.
[3] Casad, B.J. and e. al, *Gender inequality in academia: Problems and solutions for women faculty in STEM.* Journal of Neuroscience Research, 2021. 99: p. 13-23.
[4] Steinþórsdóttir et al. (2020) *Gendered inequalities in competitive grant funding: an overlooked dimension of gendered power relations in academia.* Higher Education Research & Development, 39 (2), pp. 362-375.