Science & Technology AUSTRALIA

SUPERSTARS OF STEM

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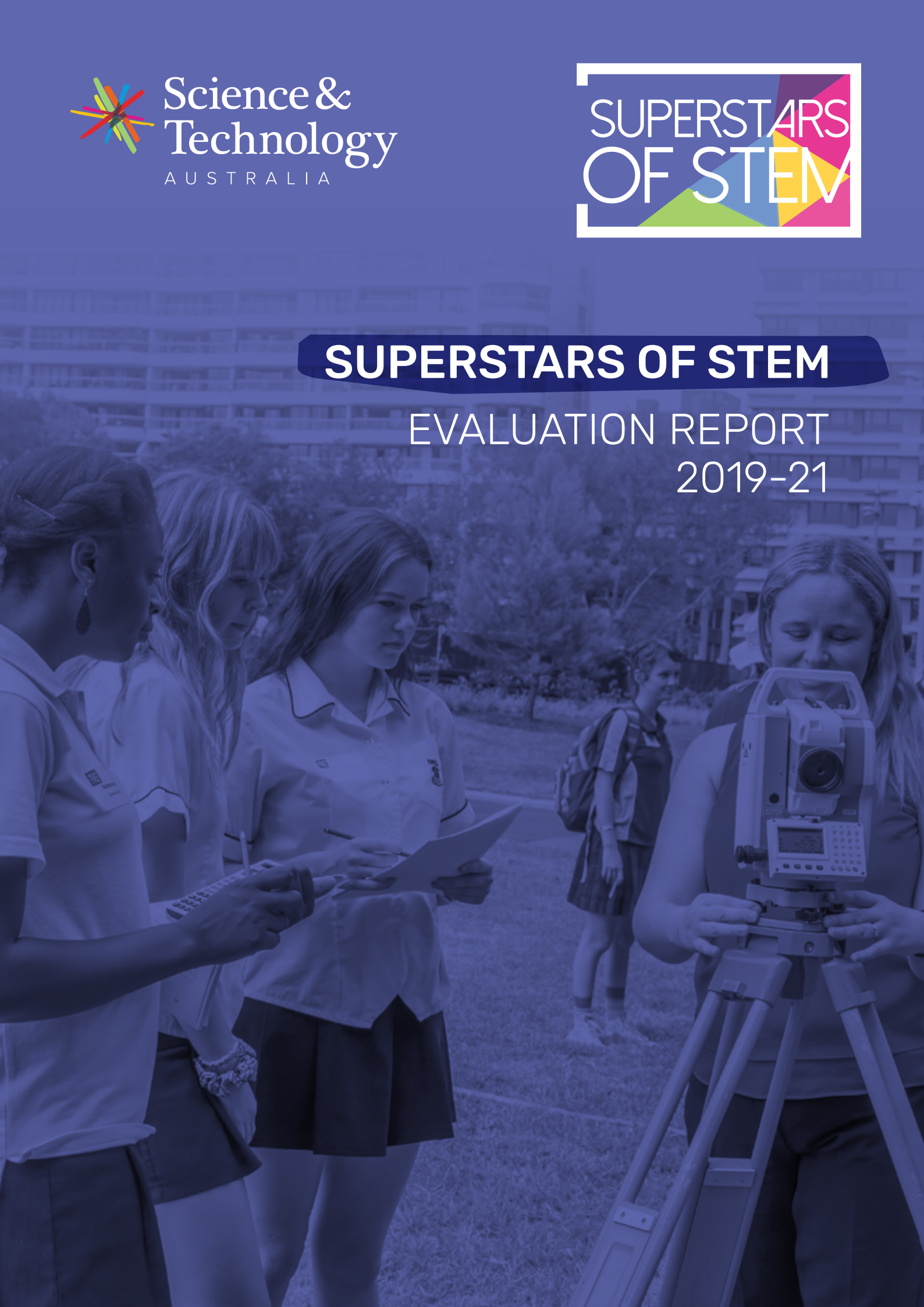
EVALUATION REPORT 2019-21



"Since it started in 2017 Superstars of STEM has grown from strength to strength, creating visible role models for girls and young women right around the country.

The program addresses the conundrum that is *'if you can't see it, you can't be it'*. It helps Australia's leading female scientists and researchers be a visible inspiration for our next generation of STEM superstars."

The Hon Melissa Price MP
Minister for Science and Technology

FOREWORD

In my role as the Australian Government Women in STEM Ambassador I am privileged to be driving change for greater equity in STEM in an ecosystem of programs like the Superstars of STEM. Research shows that diversity boosts innovation, creates better workplaces and generates higher revenue for companies. But low participation of women in the Australian STEM sector, and minimal visibility of those in STEM roles, means the nation is missing out on such positive outcomes.

Women make up only 28% of workers in STEM and in 2016, only 26% of media coverage about STEM in Australia featured women experts. The reasons for such low numbers are well documented, but highly complex and interconnected. It will take time and concerted effort to shift the dial on women's participation. The Superstars of STEM program has a unique approach to contributing to this change, by shining a spotlight on incredible women. To find if their approach is working, and what can be improved, the program has committed to evaluating their efforts and sharing the findings publicly. I applaud them for this commitment.

Some of the report findings are fantastic: up to 2 in 3 Superstars of STEM reported career progression because of the program, and teachers reported school visits have positively influenced students' subject choices. The program is removing barriers to women's progression in their careers as they are being promoted and recognised for their work. It is also creating a crucial pipeline of young Australian women from all backgrounds, who can now see themselves in fulfilling STEM careers and will contribute their diverse perspectives. The Australian public, including key influencers of young children such as parents, is shifting their perceptions of what STEM professionals look like, thus reducing stereotypes. It is easy to see how the benefits will continue to ripple out.

I commend the Superstars of STEM program for its adaptability and resilience in the continued delivery of its activities during challenging times of COVID-19. Having overcome difficult circumstances with such positive results, I am convinced the program will continue to improve in the coming years and its benefits will multiply.

I encourage everyone reading the report to think about this: what is one way you can be a Superstar and create positive change around you? I hope you will join me in growing this constellation of STEM stars.

Professor Lisa Harvey-Smith
Australia's Women in STEM Ambassador

FOREWORD

The Superstars of STEM program is a uniquely game-changing program. At its heart, it's about brilliant women lifting each other up to reach new levels of success and stepping into the spotlight as visible public role models. Surrounding these women is an incredible constellation of stellar supporters.

Firstly, the Australian Government - whose crucial investment in the program since its inception has propelled these brilliant women to new heights of public profile and career success. Program mentors who generously give their time, share insights and support these women to step more deeply into the public spotlight. Passionate trainers who share deep expertise to prepare these women for the next level of their careers. And partner organisations whose commitment to a diverse and inclusive STEM workforce leads them to put their name and their passion behind a program that is making a real difference.

These women are an amazing force for good in the world. It is a daily pleasure to support their learning and share their successes.

Science & Technology Australia has a deep commitment to continuously improving this program. We listen to participants about how to enhance and extend their skills - and how to help them deepen their impact in the world.

In undertaking this evaluation, it was wonderful to hear Australia's teachers speaking in glowing terms about how inspirational the Superstars were in their classrooms. And about how their students engaged with STEM after the visits. Employers told us about the leaps and bounds their Superstar employees were making to fast-track their careers.

We are excited to share the evaluation results with you. This program works. Powerfully. It supports women. It inspires kids. It chips away at stereotypes. It turbo-charges the profile of women in STEM to inspire others to follow their lead into STEM careers. And that is crucial to ensure Australia draws on our whole talent pool to meet future workforce shortages.

Thank you to all the interconnected parts of the Superstars of STEM constellation: the mentors, the trainers, the partner organisations, the teachers in classrooms and the STEM employers backing women in their workplaces. STA is proud to work alongside you to support a diverse and inclusive STEM sector to secure Australia's future.

And we know that you join us to say the most important thank you of all: to the Superstars of STEM. Thank you for shining your brilliant light in the world and inspiring so many. We will be eagerly watching as each of your stars continue to rise.

Professor Mark Hutchinson, President of Science & Technology Australia
Misha Schubert, CEO of Science & Technology Australia
Dr Sandra Gardam, Superstars of STEM program manager
and Deputy CEO of Science and Technology Australia

Image on left: Superstars at training event: Dr Cathy Robinson, Dr Laura Kuhar, Dr Sonja Dominik, Dr Eva Plaganyi-Lloyd, Dr Sarah Pearce and Dr Sharon Hook

It's hard to **be**
what you can't **see.**

INTRODUCTION

Superstars of STEM was born from a clear insight: It's hard to be what you can't see.

In Australia, women make up only 28% of workers in science, technology, engineering and mathematics (STEM). In many STEM fields, the percentage is even lower. When young women and girls look for role models to inspire their education and career choices, mostly they see men speaking about STEM. In 2016, only 26% of media coverage about STEM in Australia featured women experts.

Science & Technology Australia's Superstars of STEM program is creating a critical mass of women experts speaking publicly on STEM - particularly in the media. The rise of these "celebrity scientists" is designed to change public perceptions about who can be a scientist - by showcasing brilliant and diverse women in STEM.

The more people see women leaders in STEM as visible role models, the more expected it becomes that girls and young women will choose to study STEM subjects - on their way to STEM careers. Role models and the views of parents and families shape expectations and choices. Over time, a growing cohort of visible public role models in the media will make it much more likely for girls to choose study and careers in STEM. Research shows parents, families and teachers are the main influencers of students' education and career choices. Our program reaches these key influencers through mainstream and social media.

It is well recognised that low rates of women's participation in STEM careers do not have a single cause, nor a single solution. A strength of the Superstars of STEM program is that it seeks to create change using multiple levers. In addition to shifting societal perceptions, Superstars also visit schools to directly tell their career stories to students - and inspire them to follow in their footsteps.

Boosting women's participation in STEM is not purely about attracting them into STEM careers. It's also about keeping women in STEM - and helping them rise to the highest levels of leadership. A further goal of the Superstars of STEM program is to directly support the professional development and career progress of women in STEM.
The evidence is very clear: a stronger public profile and greater engagement in social media are hugely beneficial to career progression. Access to high quality communication training and networking opportunities in the program also fast-tracks career progress for those chosen as Superstars of STEM.

The Superstars of STEM program was established in 2017 by Science & Technology Australia. It is funded through the Women in STEM and Entrepreneurship grant scheme of the Department of Industry, Science, Energy and Resources. The initial pilot program recruited and trained 30 women. Its profound success led to extension of funding and expansion of the program.

OUR PARTNERS

The Superstars of STEM program would not be possible without our valued partners. Here's what they have to say about the importance of the program and why they are involved:

Australian Government

Department of Industry, Science, Energy and Resources

"The principles of the Superstars of STEM program are simple and powerful because the message resonates with everyone. It's about showing people what's possible. By showcasing women succeeding in frontline STEM roles, the next generation of scientists can envision a pathway for themselves. It's important in inspiring individual careers and is crucial for Australia in expanding our STEM resources. The program is practical and real and its success is underpinned by the depth of talent we have across the sector. We're proud to be associated with the Superstars of STEM."

Sam Maresh, Country Leader, GE Australia

"Google is committed to continuing to make diversity, equity, and inclusion part of everything we do. We are proud partners of the Superstars of STEM program and the work they do to ensure women in STEM are visible and equipped to share their work and stories."

Alex Brown, Program Coordinator, Google Australia

"As a significant employer of STEM skills, Defence recognises that it has an important role to play in shaping the conversation and policy around STEM at a national level. Role models, such as the vast array of females celebrated by Superstars of STEM, play a critical role in increasing the participation rate of women in STEM careers which is vital to achieving a world-leading STEM-capable workforce."

Professor Tanya Monro,
Australia's Chief Defence Scientist, Department of Defence

Australian Government
Department of Defence

"At STEM Matters, we are delighted to use our strategic and communications expertise to help the Superstars of STEM exceed their potential."

Kylie Ahern, Founder and CEO, STEM Matters

"It is vital that women in STEM have the skills and confidence to work with the media so young women can see themselves reflected in scientists on their screens."

Dr Susannah Eliot, CEO, AusSMC

"It has never been more important to hear the voices of the best experts but too often they struggle to be heard. Superstars of STEM helps women who know what they're talking about build profiles and take a leadership role in public debate. You only need to buy a newspaper, visit a website or turn on the TV or radio to see the progress being made to address gender bias and create compelling female role models. The Conversation is also looking to improve the gender balance in the range of experts we publish every day and we couldn't have a better partner in this work than Superstars of STEM."

Misha Ketchell, Editor and Executive Director, The Conversation

KEY FINDINGS

CHANGING STEREOTYPES

4286 Media mentions
300% growth in Twitter followers
250% growth in LinkedIn connections

> **"I have several journalists that now contact me when they have stories they want input on in my areas of expertise."**
> *Elaine van Bergen*

84% of Superstars grew their reach and profile

Planned Innovation:

Boosting digital school visits will reach more schools with kids from low socioeconomic backgrounds and Aboriginal and Torres Strait Islander kids, so we can inspire the groups least represented in the STEM workforce.

Evaluation shows: A media profile supercharges the world changing impact of women in STEM.

INSPIRING KIDS

163 schools visited
21,000+ kids inspired

> **"Keep up the good work! This is the only way to influence more and more students, especially girls to pursue STEM careers!"**
> *Awais Butt, Roma Mitchell Secondary College*

94% of teachers felt the visit influenced their students' choice of subjects

Planned Innovation:

Increased support for Superstars to organise school talks will boost the Superstars' ability to inspire even more Australian kids into STEM.

Evaluation shows:
Scientists visiting schools inspires kids to choose STEM.

BOOSTING CAREERS

In each six-month segment of the program, between 1 in 2 - and as many as 2 in 3 - Superstars reported career promotions.

> **"The Superstars of STEM program helped us fast track the career of some of our emerging female leaders, while at the same time giving back to the community through building a more diverse future STEM workforce."**
> *Anonymous, CSIRO*

93% of Superstars said the connections they made with other Superstars helped their careers.

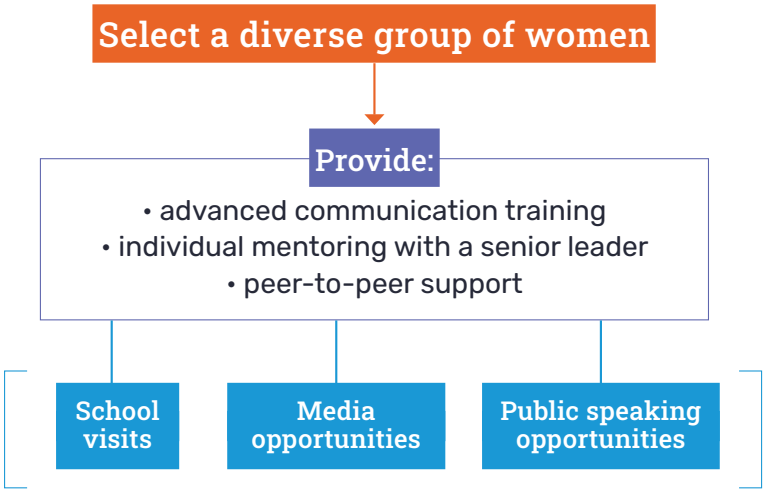
Planned Innovation:

Extending training into the second year of the program and using peer teaching will supercharge the confidence and skills of Superstars.

Evaluation shows: Building networks and raising your public profile fast tracks women's careers.

Supercharging the world-changing impact of women in STEM

HOW THE PROGRAM WORKS



60 brilliant and diverse women are selected every two years in a highly competitive process to become Superstars of STEM. STA provides advanced communication training to improve their skills and confidence in media commentary, public speaking, using social media and writing with impact. Superstars are supported with one-on-one advice with specialists to seek out and maximise media coverage, speaking and networking opportunities. We propel them to become recognised STEM experts and public leadership figures.

Each Superstar also visits schools over the two years to speak to students about their career and inspire the next generations of young women to choose STEM education and careers.
The Superstars target public high schools at years 8-10 (ages 13-16). This is when students choose their subjects for the final years of secondary school, which affects their tertiary education choices. Superstars give talks to students of all genders with a dual purpose of inspiring girls to take up STEM and normalising diverse women in STEM careers to all genders.

Each Superstar of STEM is paired with a senior mentor with a strong public profile to support them through their transition into the public spotlight. The Superstars themselves also form strong cross-disciplinary networks that support their careers and their goal of raising their public profile. The program's superpower is in the profound success of women lifting up other women.

> "The Superstars of STEM program provides outstanding opportunities for emerging women leaders in STEM."
>
> **Professor Gary Egan, Director of the ARC Centre of Excellence for Integrative Brain Function at Monash University**

> "I was promoted within my organisation, [and] I was head-hunted by another organisation"
>
> **Dr Anita Goh,**
> **Clinical Neuropsychologist**

ABOUT THIS EVALUATION

STA has a strong commitment to ongoing evaluation and continuous improvement in our programs. This evaluation had three aims: to examine the impact of the program on participants, to investigate the impact of the program on the media landscape and to identify ways to improve the program.

This evaluation reports on the 2019-2020 Superstars of STEM cohort. These 60 women began the program in January 2019 and were scheduled to complete in December 2020. The COVID-19 pandemic curtailed their ability to make school visits and limited their opportunities for public speaking. In light of this disruption, STA extended its program support - with the support of the Department of Industry, Science, Energy and Resources - for these Superstars to June 2021.

> A remarkable 100% of employers would recommend the program to another woman in their organisation based on the benefits they observed for their employee.

Data sources used in this evaluation include surveys and media and social media monitoring. At the start of the program, the 2019-20 Superstars did an initial survey that included information about their public appearances in the year before the program. They also completed surveys every six months during the program.

Media appearances were monitored via commercial media monitoring services, including a baseline review of the year preceding the program. Social media channel monitoring of the hashtag #SuperstarsofSTEM was undertaken by commercial monitoring services.

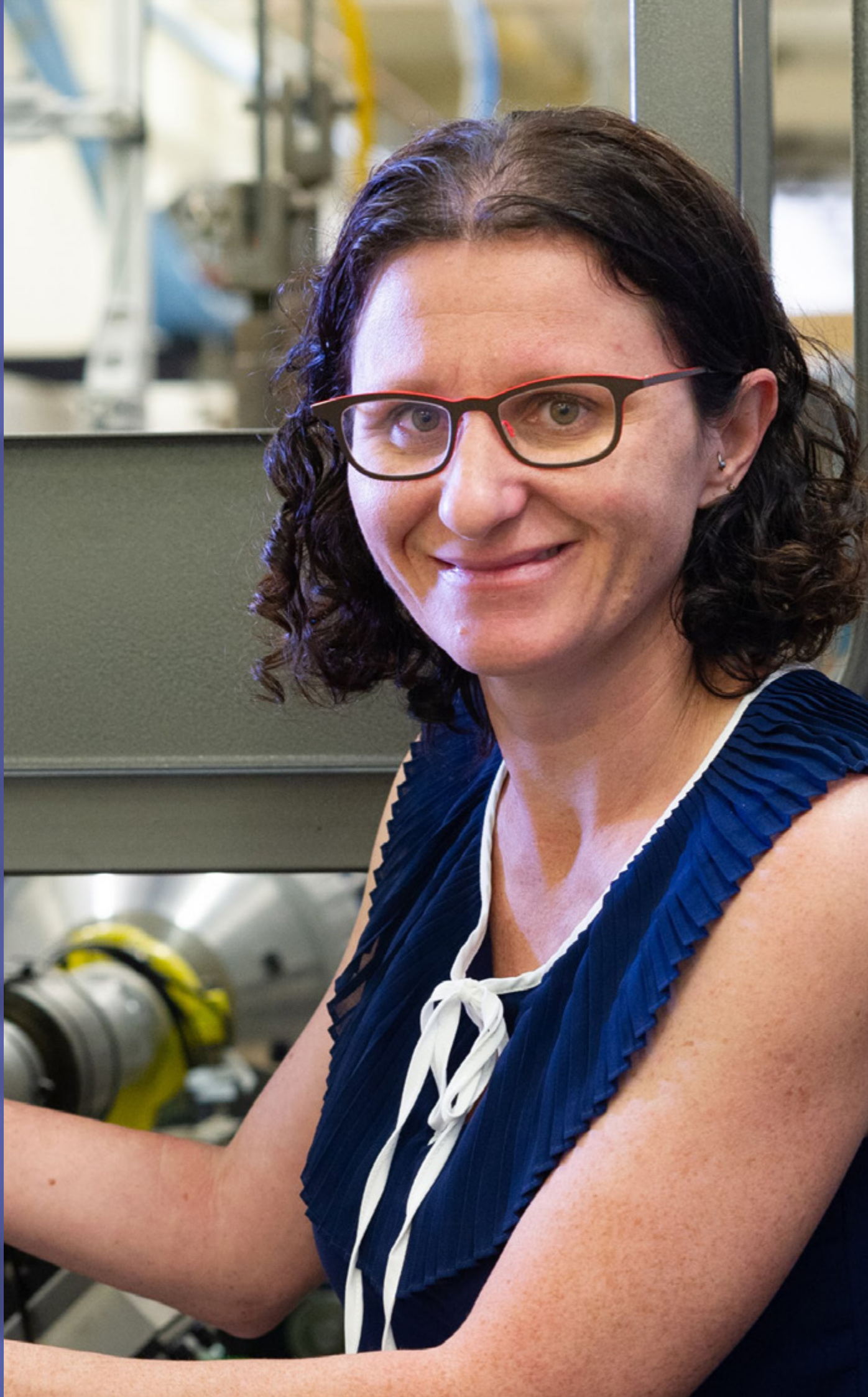
In August 2021, STA invited the Superstars' employers to complete a survey about the impact of the program. We also asked high school teachers that engaged Superstars as speakers for their opinions on the program.

CHANGING STEREOTYPES

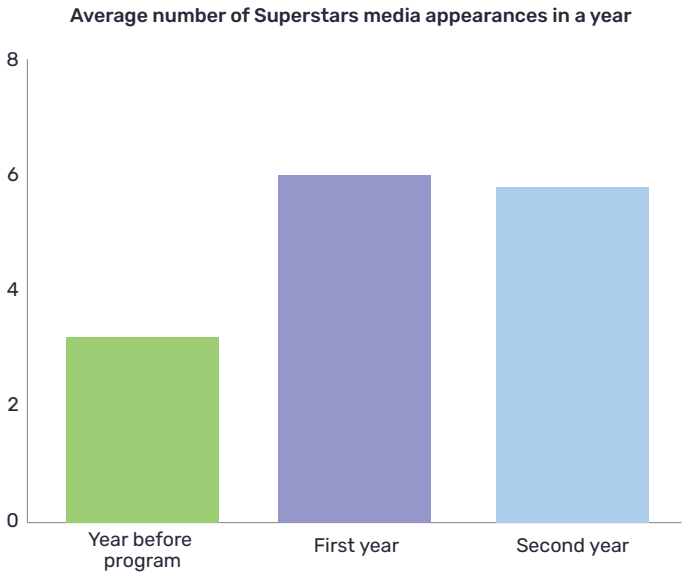
"I have a lot more confidence to speak more broadly and 'bigger picture' [about the] impact of my work and of my own career pathway."

Dr Teresa Wozniak

Image: Dr Bianca Capra, Aerospace Engineer, UNSW Canberra



The Superstars of STEM program equips participants with advanced communication skills to enable them to build a public profile. Superstars are encouraged and supported to pursue opportunities in the media and on stage as public speakers. They learn the skills to use social media effectively to promote themselves and their work.



4286 media mentions

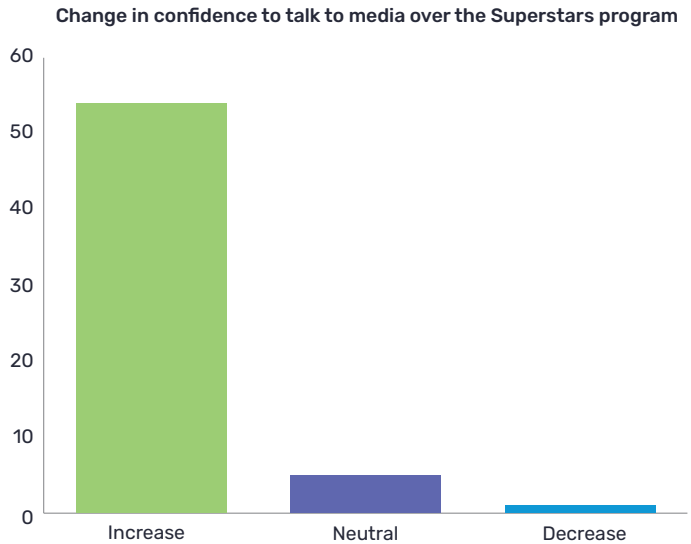
83 million people reached through traditional media from July 2020- June 2021

Traditional media

Almost all Superstars reported a significant rise in their confidence to talk to the media as a result of the program. They also self-reported strong growth in their interactions with the media.

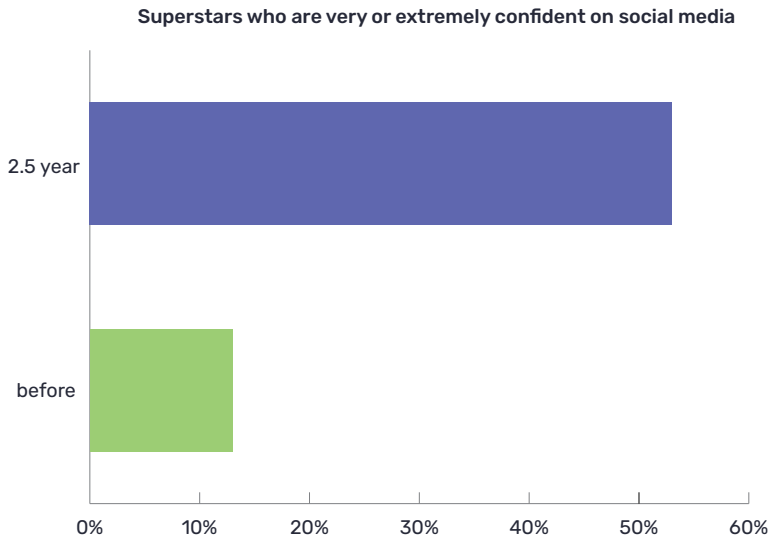
Over the course of the program, this group of Superstars generated 4286 media mentions across print, internet, radio and television. Media monitoring shows they reached 83 million people in a single year with stories about STEM which featured women. This represents an enormous opportunity to influence public opinions in Australia about what a scientist looks like.

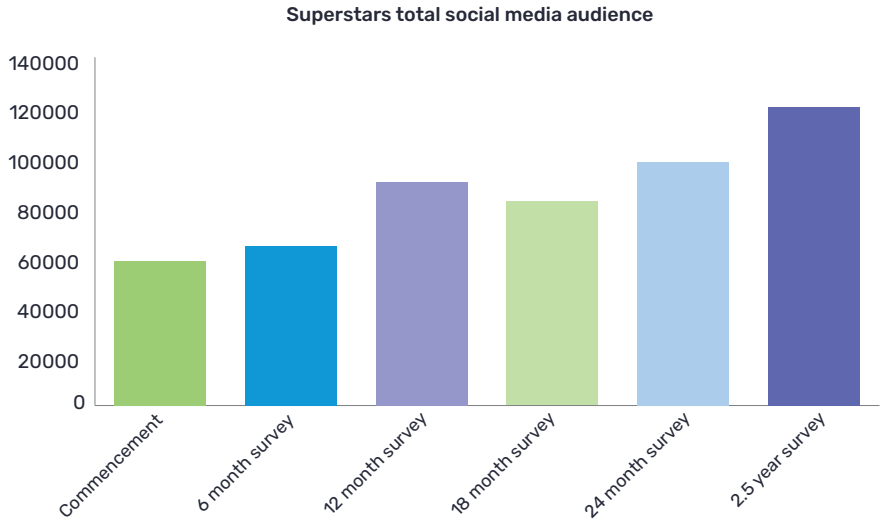
"My profile has also grown, now that it's linked to this fantastic network of Australian women in STEM." -
Dr Erin Rayment



Social media

The Superstars engaged much more with social media after joining the program. 1 in 3 Superstars reported they rarely used social media before the program. During the program, the average frequency of posting rose to weekly. Superstars also reported they were more confident on social media - with more than half rating themselves as very or extremely confident by the end of the program (compared to 13% before the program). Throughout the program, there was steady growth in the social media audience following the Superstars.





The largest growth was on Twitter where followers almost tripled, and on LinkedIn where connections grew 2.5 times.

Recognition of the program also grew strongly on social media. The hashtag #SuperstarsofSTEM was monitored throughout the program. Its reach grew from 2 million in the first six months up to 3.9 million in the final six months of the program.

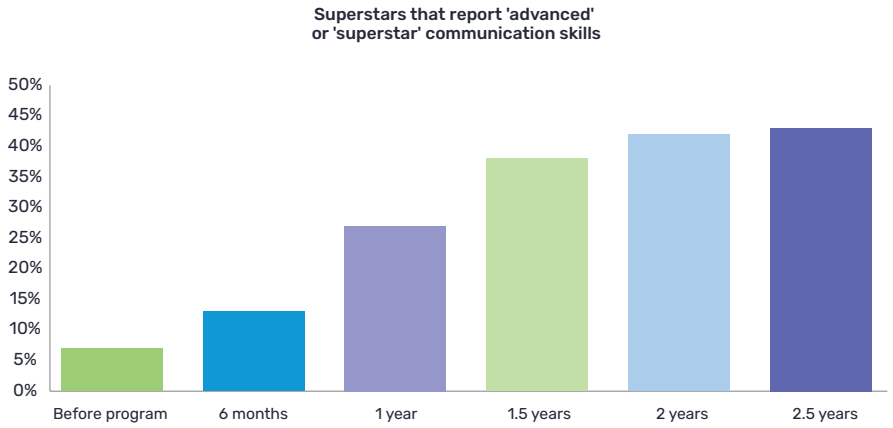
"I know how to use hootsuite to schedule tweets when two years ago I had never sent a tweet. I have over 50 videos on YouTube."
Dr Kirsten Ellis

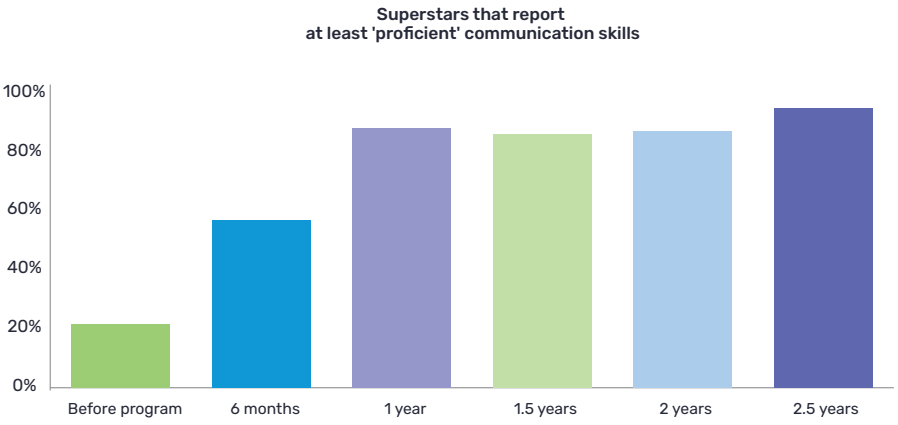
The program encouraged social media use on key days such as International Women's Day, and International Day of Women and Girls in Science. In 2020, more than 1400 tweets used the hashtag for the International Day of Women and Girls in Science.

Profile and confidence

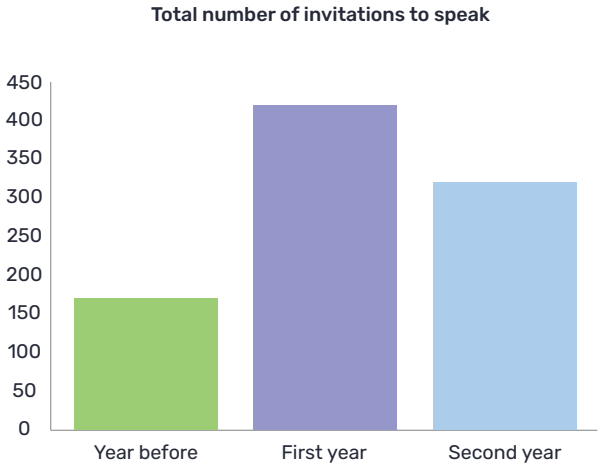
The program boosted women's communication skills significantly. At the start of the program, only 8% of them rated themselves as advanced or a 'superstar' level of communication skills. This rose to almost 1 in 2 by the end of the program. While 1 in 4 rated themselves as at least proficient before joining the program, this rose to almost 100% by the program conclusion. 96% of Superstars attributed their increase in communication skills to the program. And 84% of Superstars said their reach and profile had grown as part of the program.

The public profile of the Superstars was boosted by their participation in the program. This was most clearly demonstrated by strong growth in the number of invitations to speak at public events. The total number of invitations received by the group doubled in their first year on the program. This growth tapered in their second year amid the impact of COVID-19 placing several states into prolonged lockdowns and restricting public events.





"I now have a plan for LinkedIn posts that is increasing how often I post. I also have a bigger network to bounce ideas off that is very supportive."
Kylie Jones



Building networks and raising public profiles to fast track women's careers.

Fake face masks flood hospitals

EXCLUSIVE

Liam Mannix
Kate Aubusson

Doctors and nurses treating patients infected with COVID-19 in some Australian hospitals are wearing counterfeit face masks that have been registered with the Therapeutic Goods Administration, experts fear.

The TGA in March dropped strict regulations requiring that all masks be tested before they could be registered in Australia to address a global shortage of personal protective equipment. Following the change in regulations, health workers and mask specialists reported a flood of poor quality masks ending up in hospital wards.

The problem appears to be concentrated in the private sector, where hospitals typically buy their own masks through their own suppliers.

"We have no screen at the moment to check if you're getting a real mask or a counterfeit," said Jane Whitelaw, a member of the

Continued Page 10

STORIES FROM THE FRONTLINE
NEWS PAGES 14-15

Images: Kate Cole (on left); above: The Age (Front page) May 26, 2020

PROTECTING OUR FRONTLINE HEALTH WORKERS

Superstar of STEM Kate Cole's media leadership ensured thousands of fake and faulty face masks were replaced by safe masks in Australian hospitals amid the first wave of the COVID-19 pandemic.

In May 2020, Kate was one of a group of experts drawing attention to the fact that fake face masks were being sold in Australia. Kate is an engineer and certified occupational hygienist with over 20 years experience. She runs Cole Health, a consultancy which helps businesses prevent worker illness and injuries in industries like construction.

She grew concerned about fake masks for sale, particularly N95 and P2 masks, in the bushfire crisis. When the COVID-19 pandemic began, she knew that the issue needed to be dealt with quickly to prevent the risk to frontline health workers. She worked with STA's media team to pitch the story to media outlets. In May, it became a front-page story in The Age and the Sydney Morning Herald.

In response to the story, Federal Health Minister Greg Hunt ordered a national probe into fake masks in hospitals. The Therapeutic Goods administration then initiated a post-market review. As a result, more than 560 masks had their approval for sale in Australia withdrawn. "Bringing this issue to the media meant it progressed far more rapidly than I ever could have achieved on my own," Kate says.

She has since co-authored a public guide that explains what to look for when buying a mask and collaborated with health professionals to advocate for better testing for masks. She was also appointed an expert advisor to the National COVID-19 Clinical Evidence Taskforce. In recognition of her achievements, Kate was awarded a Medal of the Order of Australia in 2022.

Kate credits her media training in the Superstars of STEM program for giving her the skills and confidence to work with journalists to shine a light on this important public health issue. Thanks to those skills, she was able to communicate the science clearly and with enormous impact - and bring evidence to the attention of decision-makers who could make changes to make Australia's frontline health workers safer as they risked their health to treat COVID patients.

BECOMING A REGULAR MEDIA COMMENTATOR

Since being a Superstar of STEM, Dr Kudzai Kanhutu has become a regular on ABC TV's The Drum.

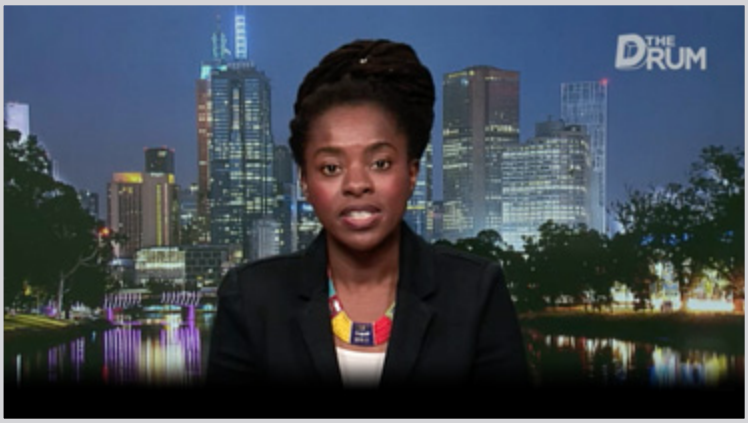


Image: Dr Kudzai Kanhutu appears on The Drum (ABC Television) July 2021

Kudzai says her strong profile on the Science & Technology Australia website and promotion by STA on social media platforms led to a media breakthrough for her. Kudzai is an infectious diseases specialist at the Royal Melbourne Hospital. She has a strong interest in telehealth and other ways to use technology to improve our health services.

Kudzai was invited to be a panellist on The Drum early in 2020. ABC TV's The Drum program engages experts and commentators to discuss the day's main stories. In her first appearance, Kudzai discussed the impact of COVID-19 on the careers of women in STEM and on how we work.

Without the training from Superstars of STEM, Kudzai says she would have said no to the invitation to be on the Drum and offered to find someone else to appear on the expert panel. Now she leaps at opportunities to do media. "Women have the right, actually it's a responsibility, to represent themselves and their communities and be part of the STEM conversation," she says.

Support from STA was also crucial in helping Kudzai understand what different parts of the media were looking for and how to prepare for different radio or TV programs.

Kudzai is now a regular part of the Drum's "bank" of panellists and has appeared on the show more than 15 times. She is a visible role model to other women in STEM and girls watching the program. She regularly demonstrates the contribution of female doctors to our fight against COVID-19.

> **"Women have the right, actually it's a responsibility, to represent themselves and their communities and be part of the STEM conversation,"**
> *Dr Kudzai Kanhutu*

INSPIRING THE NEXT GENERATION

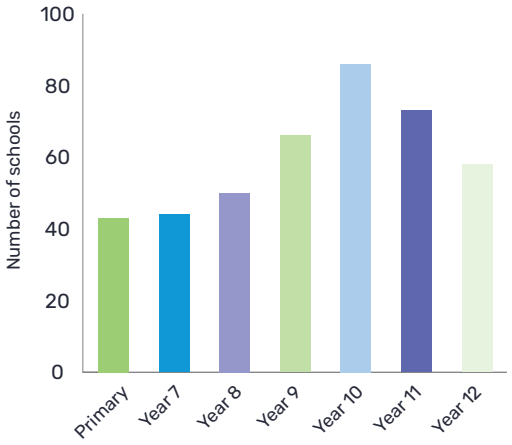
“Superstars of STEM is the perfect way to open [students’] minds to the infinite possibilities of a STEM career pathway.”

Maree Timms, teacher at Galen Catholic College

Image: Ms Carolyn Thomas, Chemical Engineer and Project Development Manager, Flotation Energy

The 2019-2020 Superstars of STEM reported over 190 school interactions, including speeches to classrooms and assemblies, appearing at career fairs or events with multiple schools, and virtual school visits. They reported interactions with 163 individual schools in Australia and reached more than 21,000 students.

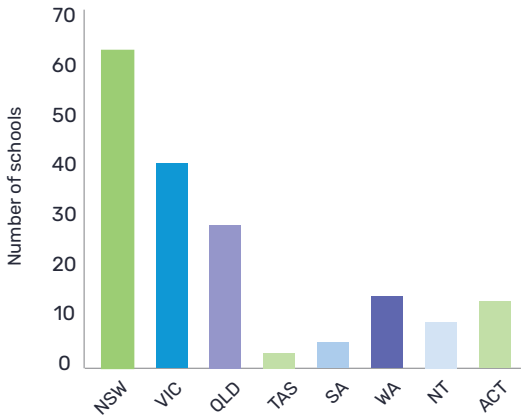
Visits interacting with each age group



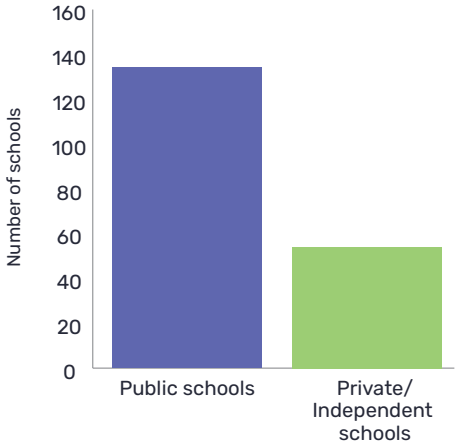
163 schools visited

21,000+ Australian school children inspired

Schools visited by state



Visits by type of school



The program is open to requests from any school or educational activity. Superstars are also encouraged to contact schools seeking opportunities. The program aims to focus on years 8-10, when students are making subject choices for their high school and senior high school years. Most school visits before the COVID-19 pandemic were in-person and most were held in the local area of the Superstar - leading to a concentration of school visits in the major cities.
While the COVID-19 pandemic forced the cancellation of some planned visits to schools in rural areas, it greatly boosted the uptake of digital talks to schools in the regions.

94% of teachers felt the visit influenced the subjects that their students chose to pursue.

In 2021, Science & Technology Australia surveyed teachers from high schools who had interacted with the program.

Teachers rated the program a stellar 9.5/10 - and 100% would recommend it to a colleague.

The top factors they cited as powerful for their students were the value of demonstrating the types of careers available in STEM and breaking down stereotypes.

Teachers were asked to identify any positive outcomes for their students:

> *"Students were able to engage with a climate scientist in a way that acknowledged their varied opinions, and revealed the many different perspectives on this issue."* Anonymous teacher

> *"All the presenters were really engaging! Students stayed behind to ask questions. Really positive role models, especially for the girls to influence them to pursue STEM careers."* Awais Butt, Roma Mitchell Secondary College

> *"Students were highly engaged and Steph was able to construct a well-planned and executed lesson. Students were able to construct sophisticated mission plans and present them to their peers. Teachers of these students have relayed they are applying and referencing the content presented by Steph at the event in their current science courses."*
> Ryan Elwell, Academy of Future Skills

> *"The students really engaged with Heidi and they were able to talk about the visuals of seeing the neurons work in the brain really well."*
> Anonymous teacher

> *"This is a fantastic program and I hope it will continue to link the real world science and the science taught in schools."*
> Marija Dojchinov, St Mary Mackillop College Canberra

> *"This is such a valuable program and I feel lucky to have met Steph who has been able to put me in touch with various women in the community doing amazing STEM work including Verity. Our students are always asking to see connections to their classwork in the real world and this program really helps me meet that need."*
> *Catriona Silverstone, Alfred Deakin High School.*

Image: Narelle Underwood introducing high school students to surveying

CHARTING A FUTURE INTO STEM

Narelle Underwood was the first woman to hold the post of Surveyor General of NSW and the youngest person in over 200 years appointed to the role. In the role she has made it a priority to focus on encouraging more diversity in the surveying profession.

Narelle helped the NSW Department of Education to develop a new Surveying and Geospatial Engineering topic for the iSTEM elective for students in years 9-10.

She worked with other representatives from the surveying industry to develop the framework for the course and put together resources and training materials to help teachers deliver the course.

The new course gives students the chance to apply maths and design skills to real world problems like developing a UN campsite for a humanitarian mission in a disaster zone. The students will get to use a variety of technology like GPS and aerial imaging.

While Narelle loves visiting schools and hosting Get Kids into Surveying Days, she recognises that she can only reach so many kids in this way. She hopes that the new course will expose more students to surveying and inspire a whole new generation of girls and boys to become surveyors.

Image: Professor Asha Rao
Mathematician

INSPIRING THE MATHEMATICIANS OF THE FUTURE

"Mathematics is core to everything we do - whether it is sewing or shopping, using an iPhone or playing AFL. The pandemic shows how essential good mathematical knowledge is to be able to respond quickly and well. Let this pandemic be the wake-up call for Australian students to learn mathematics as an essential foundation." Professor Asha Rao, Opinion piece in the Australian Financial Review

Professor Asha Rao has always been passionate about the importance of mathematics. The Superstars of STEM program has allowed her to take that passion straight into the classroom to inspire more girls and boys to study maths.

Asha has drawn on many skills she acquired in the Superstars of STEM program to supercharge her ability to have an impact on kid's choices to study maths. She now uses her new-found social media skills to reach out to and communicate with school teachers. Asha has quadrupled her twitter following through the program and is regularly interacting with her key audience of teachers. She uses her public speaking skills when she visits schools.

"Asha connected with our classes during remote learning 2.0 (Victoria) - it was the longest lockdown. So to have her positivity and enthusiasm "beam in" to our classes was fabulous. It opened their eyes to see how mathematics is a key to computing and cyber careers." Maree Timms, teacher at Galen Catholic College.

Asha's connections with teachers through twitter have seen her inspiring children from Sydney to Glasgow and beaming in to motivate trainee teachers in London.

ADVANCING THE CAREERS OF WOMEN IN STEM

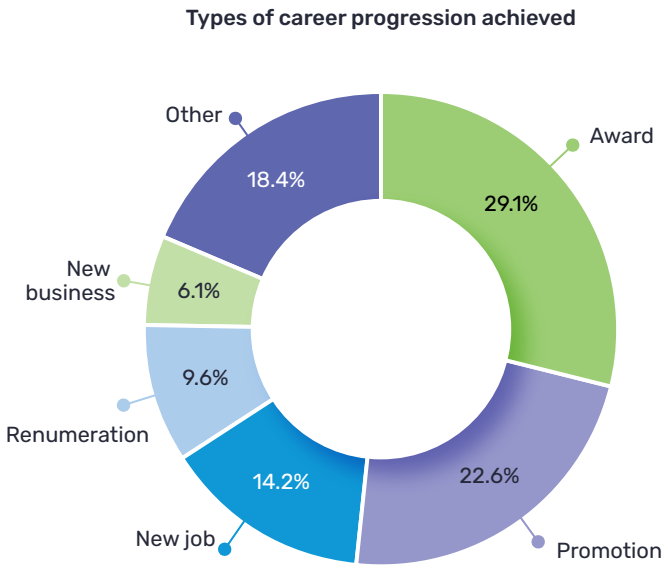
"[I gained] confidence to step out of my comfort zone, leave my previous employer and take a leap forward in my career."

Carolyn Thomas

Image: Dr Katie Sizeland, Research Program Manager in Human Health, ANSTO

The Superstars of STEM program boosts the public profile of women in STEM to inspire more girls to get involved in STEM and to change perceptions about what a scientist looks like. It also powerfully fast-tracks the careers of the women in the program. The evidence shows a stronger public profile and greater engagement in social media are hugely beneficial to career progression.

1 in 2 superstars - and up to **2 in 3** in some six month windows - reported career progression in each six months of the program



Superstars of STEM were asked about their career progression in 6 monthly surveys. In each six -month period, at least 1 in 2 Superstars - rising to as many as 2 in 3 Superstars in one survey - reported career progression. Awards were the most commonly reported career advancement followed by promotions. Other advancement opportunities include securing new funding, being invited to sit on committees and boards, invitations to speak at scientific conferences, and being a finalist for an award.

Superstars also identified other ways the program had a positive impact on their careers. At the end of the program:

- **93% of Superstars** said the connections they had made with other Superstars helped their careers
- **72% of Superstars** said the program had generated more career-enhancing opportunities
- The program led to unexpected collaborations for more than half of the Superstars.
- **71%** had even stronger leadership skills

The program positively affected the perceptions of the Superstars.

- **88% of Superstars** felt the program improved how others perceived them
- **63%** felt more supported by their employer since participating in the program.

The Superstars were asked to describe the impact of the program on them and what they now do differently as a result of the program. Many talked about practical things they did such as using social media more, being more active in promoting their work, and contacting the media proactively. Others talked about a shift in their attitude: being more confident, having a "say yes" attitude, taking more risks, thinking outside the box, taking a strategic approach to their work.

Image: Dr Onisha Patel, Dr Kudzai Kanhutu and Dr Asha Rao at Superstars training event

Employer opinions

Employers of the Superstars of STEM were surveyed on their observations about the program and its impact on the Superstars. Three in four employers said their employee's career had advanced while on the program. Of those that did not report any career progression, many employers said the program would likely contribute to future progression for the Superstar.

3 in 4 employers said their employee's careers had advanced thanks to the program

> *"I see Helen as a future senior leader within our organisation within the next few years."* Anonymous respondent to employer's survey

> *"The program has definitely helped her to progress towards promotion."* Anonymous respondent to employer's survey

Employers universally described impacts of the program as being positive on the Superstars. They cited stronger confidence, stronger communication skills and displaying stronger leadership as key attributes for those who had become Superstars of STEM.

"I have been accepted to talk at TEDXPerth, as a direct result of the program" *Dr Sam Grover*

"I was headhunted by three universities in 2019/2020 due to the visible profile." *Dr Muneera Bano*

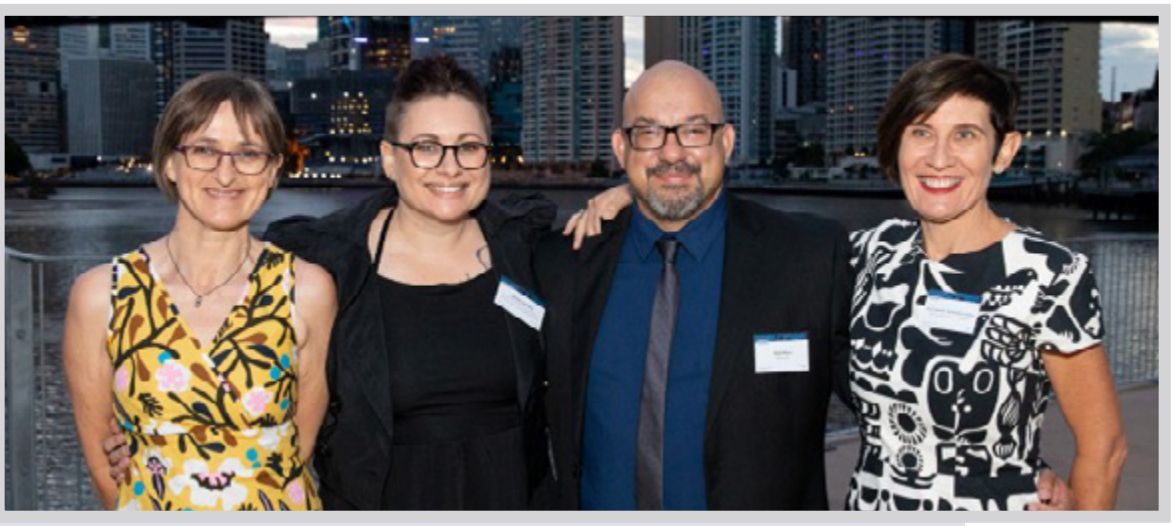


Image: Dr Robyn Marsh, Dr Kalinda Griffiths, Mark Mayo and Associate Professor Heidi Smith-Vaughan

FORMING NETWORKS THAT BOOST CAREERS

Almost every Superstar of STEM tells us the deep connections they form with other Superstars is one of the most valuable benefits of the program - and that these connections supercharge their careers.

Associate Professor Heidi Smith-Vaughan and Dr Kalinda Griffiths took the opportunity to work together through the Superstars program. Heidi researches respiratory disease and is the co-developer of HealthLAB, an interactive, mobile laboratory that promotes healthy lifestyles through engaging, hands-on, fun, evidence-based education.

Yawuru woman Kalinda uses her expertise as an epidemiologist to address complex health disparities, particularly in Indigenous populations. Both women had a passion for attracting more Aboriginal and Torres Strait Islander people to work in biomedical sciences.

Together, the two Superstars of STEM applied for and secured a biennial $1 million Ramaciotti Biomedical Research Award in 2019. The award has been used to develop the Ramaciotti Regional and Remote Health Sciences Training Centre. The centre leads the way in developing a sustainable, local and Indigenous biomedical workforce in regional and remote Northern Territory.

“This Centre will provide previously unimagined opportunities for regional and remote youth. It will support young people into further studies and right through to become industry-ready graduates to fill the gaps in our regional and remote health and biomedical workforce” says Heidi.

Since its establishment, she says the centre “has created new opportunities and networks, and seen large positive impacts on our community, and therefore on me personally.”

"The true measure of the impact of this program is not reflected in the metrics collected. It is unquantifiable, it varies from individual to individual, but be assured it is substantial."

Associate Professor Heidi Smith-Vaughan, Microbiologist

CREATING THE BEST POSSIBLE PROGRAM

"It is clear that the Superstars of STEM program is an excellent opportunity for Early and Mid Career researchers to move towards leadership positions. The university profits in a very positive way."

Professor Frans Verstraten, McCaughey Chair of Psychology, University of Sydney

Image: Dr Beena Ahmed, Electrical Engineer, UNSW Australia

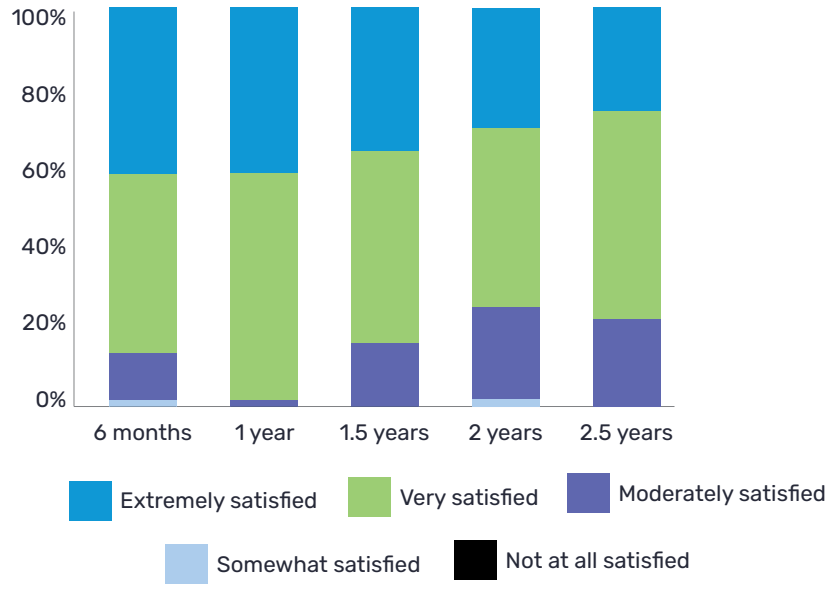
Science & Technology Australia has a deep commitment to continually evolve and strengthen the Superstars of STEM program with each new cohort to enhance its impact. We include a number of questions in our regular surveys of Superstars to measure satisfaction with the program and their views on its effectiveness.

Satisfaction levels with the program are very high. One year into the program, 98% of Superstars of STEM rated their level of satisfaction as very or extremely satisfied. This coincides with the completion of all core components of training and may reflect the strong growth in their skills and confidence over the turbo-charged first year on the program.

100% of employers would recommend the program to another woman in their organisation

In the remaining 18 months, during the vast disruptions to opportunities for face-to-face interactions caused by the COVID-19 pandemic, at least 3 in 4 of these Superstars continued to rate their satisfaction level as very or extremely satisfied. Feedback on improving the program also suggests some Superstars were keen for more training opportunities in the second year. This feedback has been used to evolve the training for the current intake of Superstars of STEM - the third cohort on the program - as they prepare to enter their second year on the program. Further detail on these enhancements is included in the next section of this evaluation report.

Satisfaction level across program duration



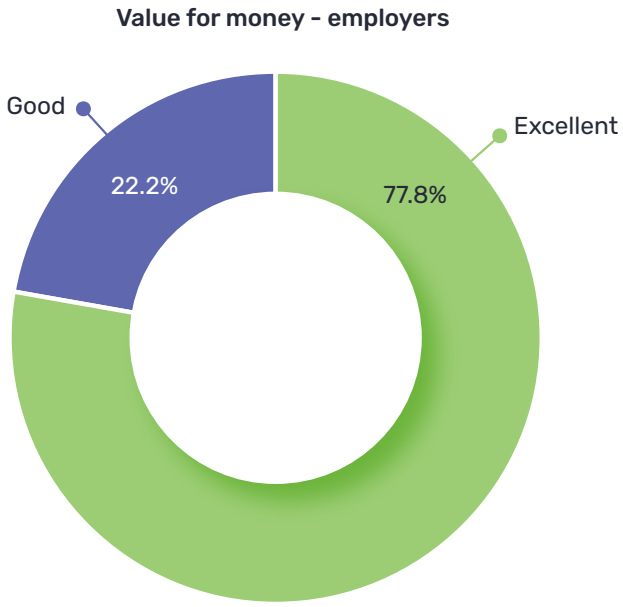
97% of the Superstars would recommend the program to a colleague.

We also asked employers about their satisfaction with the program. 100% of employers would recommend the Superstars of STEM program to another woman in their organisation based on the benefits they observed for their employee.

The strong impact of the program

By the end of the program, 81% of Superstars felt the program was very or extremely effective at boosting the public profiles of women in STEM. 84% of Superstars felt their own reach and public profile had grown. On its goal to incentivise more young women to study STEM, 46% of Superstars said it was very or extremely effective, and another 45% saw it as moderately effective (91% overall seeing some effectiveness).

Three in four employers rated the program as excellent value for money, and one in four rated it good value for money. 91% of the Superstars said the program was value for money.



> *"To see a colleague flourish, as Amy has, is worth every cent - and the connections she has made will serve her throughout her career."* Craig Whiteford, General Manager Threatened Species at Zoos Victoria

> *"Programs like this are fundamentally important for the culture of engineering and science."* Anonymous employer

The Superstars were asked about their plans after the program and whether they needed more skills to achieve their next steps. The responses indicated that, for the majority of Superstars, maintaining a public profile had become a normal part of their work life.

Many Superstars identified growing or continuing their use of social media platforms. Continuing engagements with schools were also frequently mentioned. Some Superstars identified specific career goals that they were working towards, such as getting a promotion or starting a new business.

> *"My plan is to try to make engineering more relatable to young people. I have partnered with some engineers to make 'day in the life of' videos that we hope to get out to high school students via TikTok and Instagram."* Anonymous Superstar

> *"I'll keep visiting schools, and reach out to the media when I have a good story to tell."* Dr Melanie MacGregor

> *"I …. have several journalists that now contact me when they have stories they want input on in my areas of expertise."* Elaine van Bergen

> "I feel like I have a really good grounding now to continue building my public profile steadily over the next couple of years." Dr Steph McLennan

The benefits for organisations

Employers said their involvement in the program had resulted in more media exposure for their organisation. Some found this improved their brand recognition or the awareness of particular projects their organisation was running. Another theme identified was that it allowed organisations to showcase the diversity of their staff both internally and to the public.

> *"The Superstars of STEM program has been a great asset to our organisation. It has fostered the accelerated emergence of a fabulous science communicator in Amy, as one who represents her science, our programs and our organisation in an exemplary fashion. We are all beneficiaries of her participation in the program."* Craig Whiteford, General Manager Threatened Species at Zoos Victoria

> *"It has been great to be able to promote that our organisation has a Superstar of STEM and use her as an internal role model."* Anonymous employer

> *"It is clear that the Superstars of STEM program is an excellent opportunity for Early and Mid Career researchers to move towards leadership positions. The university profits in a very positive way."* Professor Frans Verstraten, McCaughey Chair of Psychology, University of Sydney

Like, dislikes and improvements

The Superstars were asked regularly to identify what they liked most and least about the program and also invited to offer suggestions for improvements. This approach allowed STA to continually improve the program while delivering it.

Forming relationships with other Superstars and the networking opportunities available through the program were the most popular aspects of the program.

> "*Meeting the other Superstars – an incredible group of women who come from very different fields but have very similar experiences – has been invaluable. I feel encouraged and equipped to try for some dreams I would have previously assumed to be impossible."* Dr Kate Selway

> *"It is very inspiring to see how each of us (with very different journeys, fields and family commitments) navigate through our careers."* Dr Charis Teh

Superstars also commonly identified various training sessions as a most-liked component. These included public speaking training and media training. Following the advent of COVID-19, the program pivoted to offering monthly virtual catch-up sessions where Superstars shared opportunities they had undertaken and had the chance to learn from each other. These sessions were very popular with the group throughout 2020 and 2021, enabling them to maintain their connections and support each other through the hardships of lockdowns.

Much stronger confidence and a change in their own attitude were also commonly identified positives from the program.

> *"This program has truly empowered me. The skills, experiences, and opportunities that I have gained have provided me with an ideal platform to nurture and encourage protégés, especially women from culturally diverse backgrounds, to pursue careers in science. This, in turn, has helped me build my own reputation as a leader who recognises and supports talent."* Dr Devika Kamath

> *"The 'you do you' approach - we're not being forced into a mould of what a superstar "should" do and act like. I like that we're given tools and resources and trusted to make it work for us."* – Dr Steph McLennan

When asked for any criticisms of the program, Superstars expressed disappointment about not having more time to network with the other Superstars due to the lengthy COVID-19 lockdowns and restrictions. The next most common response to this question was that there was nothing that they disliked about the program.

Some Superstars in this second group on the program identified the social media training component as needing improvement. There was a variety of feedback around this element of the training - demonstrating that the Superstars have different expectations and needs around social media depending on their skill and confidence levels in social media when they join the program. For the latest intake of Superstars, STA has redesigned this training module to be more hands-on. In the future, we also plan to deliver differentiated sessions targeted to the needs of Superstars at both earlier and more advanced stages of proficiency in social media platforms.

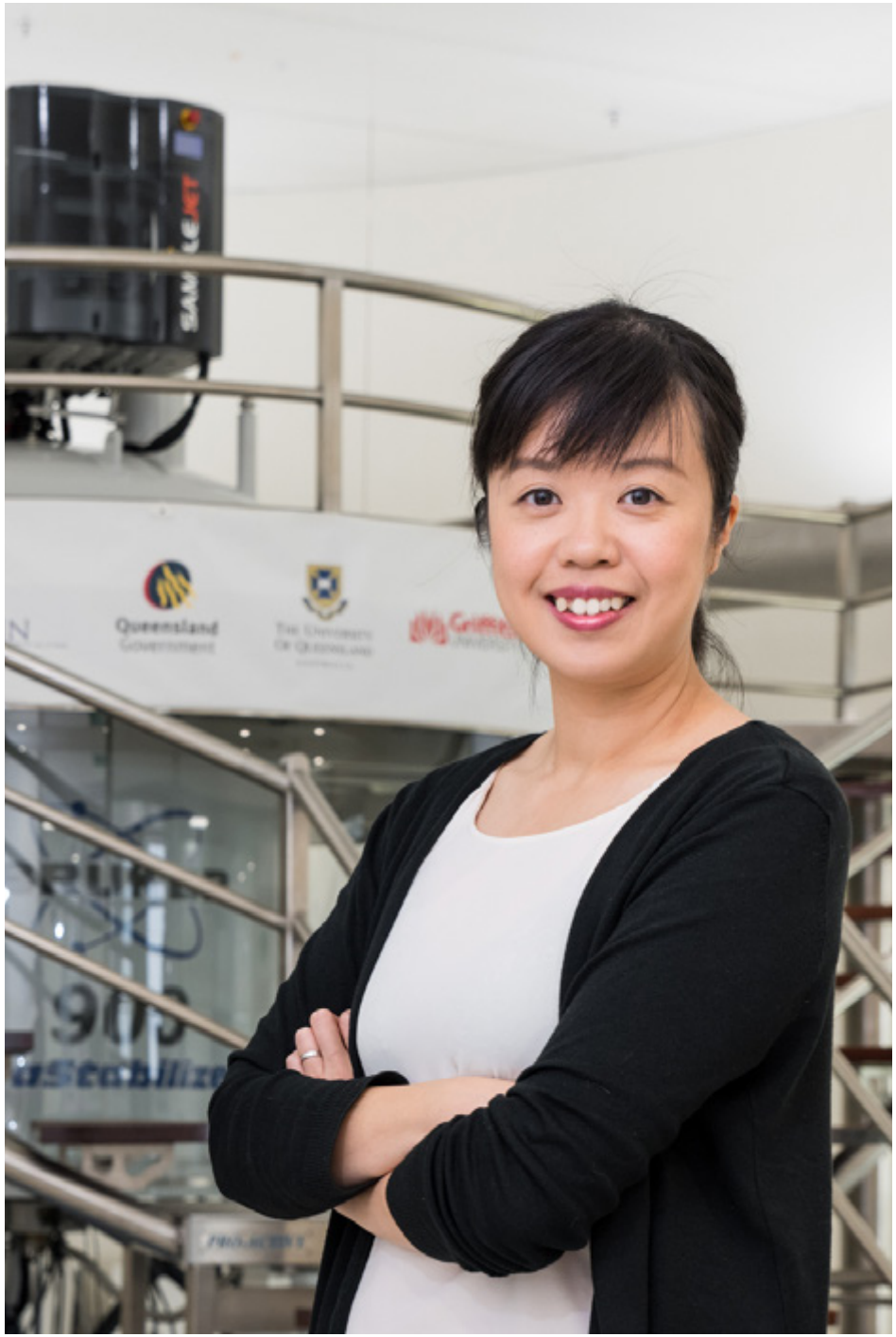
Challenges in organising school visits was also identified as an opportunity for further improvement, as the COVID-19 pandemic created extra barriers to accessing schools. Superstars also indicated a preference for training to continue into the second year of the program. How we plan to address these challenges is discussed in the next section.

WHERE TO NEXT?

“I feel like I have a really good grounding now to continue building my public profile steadily over the next couple of years.”

Dr Steph McLennan

Image: Dr Linden Ashcroft
Climate scientist, Lecturer and Science communicator, University of Melbourne



The 2021-2022 intake of Superstars of STEM are now one year into the program. Subject to securing continued funding, we hope to recruit a fourth intake of Superstars of STEM to start training in 2023.We plan the following improvements to further deepen its impressive impact and reach (see table on right).

The evidence shows clearly that the Superstars of STEM program has vast benefits for participants and their employers. The program inspires thousands of school children to consider STEM careers and helps shift public opinions about who can be a scientist, engineer or technologist.

Superstars of STEM is contributing to a more diverse media landscape in Australia and is changing stereotypes to better enable girls to choose STEM careers.

Science & Technology Australia is committed to continuously enhance and evolve the program based on surveying, feedback and tracking its success. We are open to collaborating internationally with other countries who are keen to share the benefits of this world-leading program.

Image: Dr Yanni Chin, Structural Biologist and Toxicologist,
The University of Queensland

	AREA FOR ENHANCEMENT	INSIGHTS FROM FEEDBACK	PROPOSED ENHANCEMENT
Extra support to enable more school visits.	Only 62% of the 2019-2020 Superstars fully completed their school visit requirements amid the COVID-19 pandemic. School closures and restrictions on entering schools were in place for most of 2020 and parts of 2021 in key States. Nonetheless, we identify this as an opportunity for continuous improvement.	While guidance was provided on school visits, Superstars expressed the desire for formal training sessions on how to pitch a visit to schools and how to tailor their content in talks to be most effective with school students. Superstars asked for formal mechanisms or alternative ways to make contacts with schools.	To enhance this element of the program, we will introduce training sessions on school visits. These will cover ideas on content for visits and how to make contact with schools and teachers. We will also provide training on digital school visits as an alternative to in-person visits. We are exploring how we can strengthen our connections to schools through partnering with existing programs.
Boost digital school visits to extend our reach in rural and remote areas	Most Superstars live in major cities and have previously done most of their school visits in their home cities. Many rural and remote areas have higher populations of Aboriginal and Torres Strait Islander people and people from low socio-economic backgrounds than in major cities. Both groups are significantly underrepresented in the Australian STEM workforce. Greater reach into these areas will enhance the ability of the program to reach school students.	The COVID-19 pandemic accelerated the uptake of digital technologies by all schools, including rural and remote schools. Many Superstars did digital school visits in 2020 and early 2021 due to restrictions on entering school grounds. This digital freedom broke down the traditional barrier of accessing schools in rural areas.	Digital school visits will become a standard component of the program and we are now collecting data on whether visits by Superstars are in-person or digital. Superstars will be expressly encouraged to do at least one visit with a rural or remote school.
Extend training opportunities into the second year of the program using peer teaching	Following training, the level of confidence reported by Superstars in different components of the program varied. Whilst most were highly confident in at least one of the areas, others felt they required further training in some areas. To date, the second year of the program has focussed on putting skills into practice - and training opportunities have been limited to a few sessions of interest to the participants. The program aims to equip participants with key skills to pursue being an active STEM role model throughout their career. Therefore we want to ensure all participants leave the program feeling prepared to realise that vision.	We have learned that one of the most successful ways to encourage learning and behavioural change is through peers sharing their experience and skills. Some Superstars expressed that they felt more training should have been offered in the second year of the program. It is clear that individual Superstars have differing training needs, depending on their levels of skills and confidence coming into the program. Some need additional or refresher training to confidently master new skills in media, social media and public speaking.	After formal training with external facilitators is completed, participants will identify areas of the content where they excel and create short training sessions on these for their peers. The Superstars will also be asked to identify areas of content where they would like more practice - and attend sessions delivered by other Superstars in those areas. We think this process will further enable each Superstar to tailor their learning to address any gaps they have, as well as providing opportunities to extend their skills further.


SUPERSTARS
OF STEM
WWW.TURBOCOLLAGE.COM

THE 2019-2020 SUPERSTARS

These inspiring women are the 2019-2020 Superstars of STEM:

Dr Beena Ahmed, University of New South Wales

Dr Linden Ashcroft, University of Melbourne

Dr Muneera Bano, School of Information Technology, Deakin University

Dr Deborah Bower, University of New England

Dr Bianca Capra, UNSW Canberra

Dr Yanni Chin, University of Queensland

Dr Amy Coetsee, Zoos Victoria

Mrs Kate Cole, Cole Health

Mrs Bonnie Coxon, Cowal Gold Mine - Evolution Mining

Dr Susanna Cramb, Australian Centre or Health Services Innovation

Dr Roberta De Bei, The University of Adelaide

Dr Sonja Dominik, CSIRO Agriculture and Food

Dr Kirsten Ellis, Monash University

Dr Kate Fox, RMIT University

Ms Felicity Furey, Swinburne University of Technology

Dr Anita Goh, National Ageing Research Institute

Dr Kalinda Griffiths, University of New South Wales

Dr Samantha Grover, RMIT University

Dr Sharon Hook, CSIRO

Ms Erin Hughes, Hydrology and Risk Consultancy

Dr Natasha Hurley-Walker, Curtin University

Dr Sharna Jamadar, Monash University

Ms Kylie Jones, Diageo

Dr Devika Kamath, Macquarie University

Dr Kudzai Kanhutu, Melbourne Health

Dr Laura Kuhar, Commonwealth Scientific and Industrial Research Organisation

Dr Joanne Lackenby, ANSTO

Dr Lizzy Lowe, Cesar Australia

Dr Melanie Macgregor, University of South Australia

Dr Jennie Mallela, Department of Agriculture, Water and Environment

Dr Steph McLennan, Geoscience Australia

Dr Phoebe Meagher, Taronga Conservation Society Australia

Dr Madeline Mitchell, CSIRO

Dr Caroline Moffat, Curtin University

Dr Ellen Moon, Deakin University

Dr Caroline Moul, University of Sydney

Dr Verity Normington, Department of the Attorney General

Professor Iona Novak, Cerebral Palsy Alliance, The University of Sydney

Dr Onisha Patel, The Walter and Eliza Hall Institute of Medical Research

Dr Sarah Pearce, CSIRO

Dr Kari Pitts, ChemCentre

Dr Eva Plaganyi-Lloyd, CSIRO

Professor Asha Rao, RMIT University

Dr Erin Rayment, Queensland University of Technology

Dr Cathy Robinson, CSIRO

Dr Helen Salouros, Department of Industry, Innovation and Science

Dr Verena Schoepf, The University of Amsterdam

Dr Kate Selway, University of South Australia

Dr Katie Sizeland, Australian Synchrotron,ANSTO

Associate Professor Heidi Smith-Vaughan, Menzies School of Health Research

Ms Jacqueline Tate, Coder Academy

Dr Charis Teh, The Walter and Eliza Hall Institute of Medical Research

Ms Carolyn Thomas, Flotation Energy

Dr Alex Thomson, University of Technology Sydney

Dr Juliette Tobias-Webb, Self employed

Dr Teresa Ubide, The University of Queensland

Mrs Narelle Underwood, NSW Department of Finance, Services and Innovation

Ms Elaine van Bergen, Microsoft

Dr Georgia Ward-Fear, University of Sydney

Dr Teresa Wozniak, Menzies School of Health Research

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