



An Australian Government Initiative

Women in STEM Ambassador

Women in STEM Ambassador initiative Evaluation Report 2018-2020



Executive summary

The Women in STEM Ambassador initiative is a program funded by the Australian Government to improve the participation of girls and women in STEM study and careers. This report evaluates the first term of the Ambassador, determining the impact of the role and work on the gender equity attitudes and behaviours of Australians.

The Women in STEM Ambassador has built a positive national profile as a visible STEM role model and influenced national discussion of issues affecting women in STEM through media, public engagements and outreach. In her first term, the Ambassador had a total combined reach of 48.8 million Australians through media coverage, 2.8 million through social media and 35,150 people through public engagements and outreach. Analysis of the Ambassador's engagements revealed a transition from predominantly public talks and school visits early in her term to mostly online events, meetings with key stakeholders and providing expert advice. This shows that engagement with the community was maintained during the COVID-19 pandemic through virtual events. It also reflects the focus on providing advice to leaders and policy makers as an important priority for the Office, and growth in recognition of the Ambassador's role as a trusted advisor on gender equity in STEM.

The Office of the Women in STEM Ambassador delivered five successful public engagement activities and events in 2019-2020, which communicated key messages to STEM educators, school-aged children, parents and carers and early learners. Through these events the Office has equipped educators with strategies to address gender equity in STEM classes, communicated interesting STEM careers to girls through powerful role models and challenged STEM stereotypes with parents and carers and early learners.

The Ambassador's advocacy role has grown, evidenced by increased involvement in working groups, participation in committee meetings and input into various responses to the COVID-19 pandemic's impacts on women in STEM. Her advocacy work also aims to influence leaders and decision makers in the STEM sector to drive systemic change to retain women in STEM careers.

The Office has delivered an evaluation resource to enable women in STEM programs to self-evaluate and commenced a study of anonymised review in the allocation of research resources in collaboration with national research organisations. These projects are ongoing, supported by the STEM community and are anticipated to be highly valuable to attract, retain and progress women in STEM careers.

Key recommendations for the initiative emerged from the evaluation. The Ambassador's platform will continue to be used to amplify current women in STEM activities and programs. Strong collaboration and strategic relationships will continue to enable communication with young women about STEM careers and further increase awareness and action towards addressing gender inequity.

Further consideration should be given to reaching audiences who aren't already STEM-positive and engaged. Additionally, the Office's future work should promote and apply an intersectional lens when addressing the barriers faced in STEM and in advocacy activities. The Ambassador's next term should focus on continuing to grow the role and the Office as a sought-after authority among STEM gender equity practitioners and STEM organisations through targeted communication and engagement activities.



Introduction

The Women in STEM Ambassador is an initiative funded by the federal government as part of its efforts to increase the participation of girls and women in STEM study and careers. Professor Lisa Harvey-Smith was appointed as Australia's inaugural Women in STEM Ambassador in October 2018. The Ambassador works on a national scale to raise awareness of issues affecting women in STEM and collaborates with the community to reduce barriers to girls and women's participation in STEM study and careers. The Ambassador engages with government, industry, research and education and training to drive social and cultural change for gender equity.

The Ambassador works to achieve these objectives by being a visible role model to inspire aspiring scientists, influencing leaders and policy makers, informing national discussion on gender equity in STEM, driving change in institutions and workplaces, communicating the value and opportunities of STEM careers to the community and working with educators to encourage girls' prolonged engagement with STEM.

The work of the Ambassador and her Office is informed by and supports the implementation of the Government's *Advancing Women in STEM* strategy and the *Women in STEM Decadal Plan*, developed by the Academy of Science and Academy of Technology and Engineering in consultation with Australia's STEM community.

This evaluation report aims to identify and assess the outcomes and short-term impacts of the Ambassador and her Office's activities in her first two-year term. It evaluates the success of the initiative against its objectives and key evaluation questions and provides recommendations for improvement.

Evaluation approach

Evaluation of the Women in STEM Ambassador (WISA) initiative was conducted based on activity from December 2018 to November 2020. The Evaluation Program Logic can be found in Appendix 1 and a Table of key indicators and targets in Appendix 2.

The main question this evaluation seeks to answer is: **“To what extent have the STEM gender equity attitudes and behaviours of Australians changed as a result of interaction with the Women in STEM Ambassador?”**

The following supporting questions assist in addressing the main evaluation question:

- To what extent has the WISA changed **perceptions** of women in STEM in Australia?
- What **actions and behaviour change** has occurred amongst Australians as a result of the WISA activities?
- To what degree has the WISA influenced **national discussion** about gender issues in STEM?
- In what ways is the WISA affecting **systemic change** to support an increase of women in STEM?

Evaluation design

The evaluation of the WISA initiative was informed by three main sources; web and media analytics, content and activity tracking, and engagement feedback (surveys and unprompted feedback). Data was collected according to the Table of key indicators and targets (Appendix 2)



and a comprehensive indicator matrix detailing additional evaluation data points aligned to priority areas and evaluation questions.

Intended outcomes and evaluation questions

Four priority areas for WISA activities have been identified to help organise and assess the extent to which the WISA has influenced change in Australian's perceptions, action/behaviours, systems and national discussion around gender equity issues in STEM.

Priority Area 1: Visible role models

This priority area is concerned with whether the Women in STEM Ambassador is a visible STEM role model, and whether the Office is raising the visibility of diverse women in STEM role models. The intended outcomes aligned with this priority area are:

1. The Women in STEM Ambassador has a consistent national profile that is connected to key program messaging.
2. The Ambassador profile is leveraged to publicly support other women in STEM.

The questions guiding evaluation of this priority area are:

- What is the extent of the WISA's profile?
- How have Australians responded to and engaged with the WISA?
- In what ways has the WISA amplified visibility of diverse women in STEM?

Priority Area 2: STEM education

The STEM education priority area focusses on encouraging and inspiring girls to pursue STEM studies and careers, by empowering girls and supporting their teachers and carers to encourage girls' STEM interests. Key intended outcomes for this priority area are:

1. Women in STEM Ambassador interactions increase girls' knowledge about possible STEM careers and their perception that STEM careers are interesting and achievable.
2. Teachers and parents/carers support the Women in STEM Ambassador's messaging and provide practical opportunities for girls to explore and develop their STEM interests.

Key questions guiding evaluation of this priority area are:

- To what extent do girls feel empowered and inspired to pursue STEM subjects, study and careers after engagement with the WISA?
- In what ways has the WISA influenced parent/carers support of STEM as a valid interest and potential career choice for girls?
- How are teachers employing the messaging, learnings and resources of the WISA to provide opportunities for girls to develop STEM interests and experience?

Priority Area 3: Advocate for gender equity in STEM

This priority area is concerned with the extent to which the Ambassador is increasing awareness of women in STEM issues and engaging with stakeholders across the sector to promote action to address gender equity. The intended outcome of this priority area is:

1. As a result of interaction with the Women in STEM Ambassador, STEM stakeholders are aware of and responding to gender equity in STEM issues.



Key questions guiding evaluation of this priority area are:

- Is the WISA positioned and perceived as an authoritative source of knowledge on gender equity in STEM?
- In what ways has the WISA raised awareness of issues related to gender equity in STEM?
- How is the WISA supporting stakeholders to improve gender equity in STEM?

Priority Area 4: STEM careers

This priority area focusses on the extent to which the Ambassador's activities are attracting women to STEM careers and supporting the sector to address systemic and cultural barriers that prevent organisations from retaining women in STEM fields. The intended outcomes of this priority area are:

1. As a result of interaction with the Women in STEM Ambassador, women perceive STEM careers as interesting, feasible and sustainable.
2. As a result of interaction with the Women in STEM Ambassador, organisations within the sector are implementing, monitoring and evaluating actions to enhance women's retention.

The questions guiding evaluation of the STEM careers priority area are:

- How has the WISA influenced women's perceptions of attractiveness of STEM careers?
- In what ways have WISA activities enhanced the quality of STEM careers for women?
- How is the WISA supporting STEM sector organisations to enhance women's retention?

Program evaluation: outcomes

Priority Area 1: Visible role models

A key outcome of the WISA initiative is that the Ambassador acts as a role model, building a consistent national profile that is connected to strong program messaging. The Ambassador's profile should also be leveraged to support other women in STEM.

To assess this priority area, the evaluation tracked and measured the Ambassador's profile and reach through social media, engagement and outreach.

Profile and reach through media

The Office of the Women in STEM Ambassador has utilised a range of media to build the Ambassador's national profile as a visible STEM role model and trusted voice on issues affecting women in STEM. The Ambassador's audience reach through media coverage has grown over her first term, from 1.6 million people in the first year, to a peak of 21 million in the period 1 February-31 May 2020. Total combined reach through media coverage was 48.8 million.

From 1 October 2018 to 31 October 2020, Lisa Harvey-Smith or the position of the Australian Government Women in STEM Ambassador was mentioned in 1536 items across print, broadcast and online media, 1073 of which were actively generated by the Ambassador. Media coverage of the Ambassador was 100% favourable.



Leading media themes included Professor Harvey-Smith's National Press Club address, which reached an estimated 213,000 Australians, the STEM Holiday Activity Guide and the Astrophysics Live workshops, COVID-19 impact on women in STEM and the 2020 Women's Economic Security Statement. The Ambassador's prominence in media coverage (being the primary focus of 29-52 per cent of media items) since the announcement of her role in October 2018 highlights her high profile and media interest in her role and activities. Media coverage of the Women in STEM Ambassador was predominantly on radio, online and TV, with mainstream media as the leading source of coverage, including ABC, News Corp and Nine Publishing.

The three key messages in media coverage over the Ambassador's first term included:

- Science is interesting and fun
- Build visibility and drive needed cultural and social change for gender equity in STEM
- We need to build a gender-balanced workforce supported by an inclusive workplace culture that values diversity.

The frequency and fidelity of these key messages highlight Professor Harvey-Smith's status as a STEM role model and thought leader on gender equity in STEM and indicates communication of important issues relating to women in STEM, however further work can be done to hone these key messages in media engagements, e.g. 'science is interesting and fun' could be more strongly linked to key program messaging. Media predominantly referenced Professor Harvey-Smith as the Women in STEM Ambassador or 'astrophysicist', indicating high visibility of both her Ambassador role and profile as a STEM role model in media coverage.

Social media

The Office built up the Women in STEM Ambassador social media channels from zero in January 2019 to 3242 followers on Twitter, 1599 followers on Facebook, 992 followers on Instagram and 1510 followers on LinkedIn (at the end of reporting period). The Office's potential audience reach via social media is 2.8 million people. There was a 1-6 per cent increase in followers after key events and announcements on social media (e.g. Women in STEM workshop for educators, launch of the Evaluation Guide), indicating support for the Ambassador role and continued interest in the Ambassador's activities following engagement. The most prominent messages in posts across the Women in STEM Ambassador social media channels were:

- Workplace gender equity
- Call to actions promoting Women in STEM Ambassador events
- Sharing Women in STEM Ambassador or other publications relevant to gender equity.

The increase in social media engagement following key events and positive sentiment in the media are indicators of positive public response to the Ambassador.

Engagement and outreach

The Ambassador engaged 35,150 people across Australia through her speaking engagements, outreach and other activities (excluding media). The largest audiences were school teachers (13,148), high school students (2,516) and general public (2,965). The Ambassador reached 9,000 people in 2018-19 and 26,150 people in 2020 through engagement and outreach.

The Ambassador undertook 115 hours of outreach and engagements in her first term. Her main engagements (excluding media) in 2019 were school visits and public talks. In 2020, the Ambassador's main engagements were online events, key stakeholder meetings and providing



expert advice. This reflects a rapid transition to online events in response to the COVID-19 pandemic, as well as a focus on providing advice to leaders and policy makers as an important priority for the Office. The number of tracked public engagements increased from 63 in 2019 to 101 in 2020. These engagements include a range of activities such as online and in-person public events, key stakeholder meetings, expert advice given, videos promoting women in STEM initiatives and school visits.

Notable activities included:

- Delivering the Science Meets Parliament National Press Club address, advocating for actions to improve gender equity in STEM to over 213,000 Australians
- Visiting schools and gold mining industry workplaces for a week throughout large regions of remote Western Australia in partnership with the CoRE Learning Foundation and Questacon
- Keynote addresses at the Women in STEM Decadal Plan symposium, the Catalysing Gender Equity in STEM conference and the launch of the STEM Women website.
- Delivering the keynote address at the inaugural Hopper Down Under conference in Australia
- Delivering a virtual keynote at the Girls Day Out in STEM 2020 to 798 young women.
- Participating in Monash University's "Let's Talk STEM" webinar, which was viewed by 7,200 educators
- Keynote at the NSW Regional STEM Education Conference 2019, to an audience of 600 teachers
- ASEAN Women in Innovation Leadership Dialogue panel speaker
- Presenting at the 2019 European Gender Summit in Amsterdam
- Authoring forewords for publications for school students including the 2019-20 STEM Careers Guide, the Careers with STEM: Maths magazine and the 2020-21 STEM Careers Handbook.

Key messaging was consistent in the Ambassador's speaking engagements, supporting her national profile connected to key program messaging. The Ambassador's speaking engagements focussed predominantly on the priority areas of STEM education and advocating for gender equity. The most prominent key messages in the Ambassadors speaking engagements were:

- Strategies to promote gender equity in the classroom
- Challenging STEM stereotypes
- The importance of diverse role models.

Call to actions included promoting key government-funded women in STEM initiatives and were tailored to audiences e.g. the Girls in STEM Toolkit for educators and the Women in STEM Decadal Plan, Science in Australian Gender Equity and the Advancing Women in STEM strategy for industry leaders and policymaker audiences.

This media activity and broad engagement with key audiences and STEM stakeholders indicates that the Ambassador is active in the community and strongly communicating key STEM gender equity messages in line with the position aims. Professor Harvey-Smith's inclusion in Good Weekend's Who Mattered 2019: Science list of people 'defining our nation' is



evidence of the public awareness of her role. The significance of the WISA initiative in supporting women in STEM was recognised by its inclusion as a case study in the 2020 Women's Economic Security Statement.

The Office of the Women in STEM Ambassador has amplified visibility of diverse women in STEM through involving women STEM role models in its events. Six members of the 2020 Superstars of STEM cohort and six of Questacon's women science communicators were involved in facilitating workshop discussions with teachers and STEM educators. The Office also held a Q&A panel on STEM careers during National Science Week, which highlighted the career journeys of Marita Cheng (engineering and tech entrepreneur and founder of Aubot) and data scientist and Yawuru woman Kalinda Griffiths.

The Ambassador also contributed to recognising women in STEM by supporting the Prime Minister's Prizes for Science in 2019 through her role as a selection committee advisor and appearing in targeted advertising encouraging nominations of women. These measures contributed to an increase in nominations of women from 32% in 2018 to 42% in 2019 and women being awarded 5 of the 7 prizes.

Priority area 2: STEM education

Another priority of the Ambassador is to encourage and inspire girls to pursue STEM studies and careers. This is achieved through empowering girls and supporting their teachers and carers to encourage girls' STEM interests.

To assess this priority area, the evaluation tracked and measured the influence of the Ambassador's interactions and engagement with girls, educators and carers.

The first outcome for this priority is that the Ambassador's interactions increase girls' knowledge about possible STEM careers and encourage perceptions that these careers are interesting and achievable. A further outcome is that teachers and parents and carers support the Ambassador's messaging and provide practical opportunities for girls to explore and develop their STEM interests.

The Office has worked to achieve these outcomes through outreach events and public engagements, primarily aimed at teachers and school-aged children. The Ambassador engaged with school teachers and other educators through speaking at educators' conferences and through a targeted workshop on barriers to girls' participation in STEM and strategies to improve gender equity in the classroom. The Ambassador spoke at four education-focussed conferences and events in 2019 and increased this to ten in 2020, reaching 13,250 school teachers and other educators.

Women in STEM workshop for educators

The Office delivered a workshop for primary and high school STEM educators to raise awareness of barriers to girls' engagement in STEM and share resources and strategies to promote girls' participation in STEM at school. The #WiSTEMxQ workshop for educators, delivered in partnership with Questacon and the Superstars of STEM, had a direct impact on supporting teachers to improve girls' engagement in STEM, with survey data (n=17) indicating that:

- 64% of participants agreed that they would implement changes to their teaching or program as a result of the workshop
- 94% of participants agreed that the workshop increased their knowledge of resources to improve gender inclusivity in the classroom



- 70% of participants agreed that the workshop increased their knowledge of strategies to improve gender equity in the classroom
- 59% participants agreed that the workshop increased their understanding of gender equity in STEM education
- Participant feedback indicated that the workshop gave educators helpful resources to engage girls in STEM and improve gender equity in the classroom (e.g. the Girls in STEM Toolkit). On the day of the workshop, the Girls in STEM Toolkit had 178 page views and 45 new users.

Selected insights educators gained from the workshop included:

- “Girls are interested in STEM they just need to be given the opportunities to explore the possibilities”
- “Breaking stereotypes should not just focus on the students themselves but also their families (wider community)”
- “To show how STEM skills are required in careers – even those we wouldn’t normally consider to be STEM-related.”
- “There are strong female role models available in Australia.”

This event and the Ambassador’s speaking engagements improved teacher’s understanding of barriers to girls’ participation in STEM and provided strategies to engage girls in STEM at school. Assessing the impact of WISA events on teacher’s confidence in reducing gender bias in their classroom and educating students about STEM careers and pathways should be a focus of future events aimed at educators.

Through these events, the Office has equipped teachers with gender equity learnings and resources to reduce gender bias in their classrooms and provide opportunities for girls to explore and develop STEM interests.

Super STEM careers Q&A

The Office celebrated National Science Week by hosting a virtual Super STEM Careers Q&A event for high school students. The event was watched live by 129 attendees and received a total 313 views at the end of the reporting period. Survey data indicated that 90% of respondents (n=21) agreed that following the event they want to study STEM because they want to make a contribution to society and that listening to the STEM professionals on the panel made them more interested about jobs in STEM. This was an engaging event that promoted diverse women in STEM role models and improved attendees’ understanding of STEM careers by highlighting elements of STEM careers that appeal to girls, such as team work and social impact.

STEM holiday activity guide

In the evaluation period, the Office produced three activities aimed at parents and carers and their children. The first was a STEM Holiday Activity Guide, providing parents with children’s activities over the holidays to promote STEM skills. The guide was a leading media theme from interviews on ABC Radio in December and January 2019, generating 174 media items in December and January 2019.

Astrophysics live with Lisa Harvey-Smith

In response to demand for virtual education offerings during the rapid transition to online schooling, the Ambassador delivered a series of *Astrophysics Live with Lisa Harvey-Smith* workshops aimed at primary school students. The interactive workshops were shown on



Women in STEM Ambassador

YouTube with a live interactive audience Q&A. The Office partnered with the NSW Department of Education’s DART Connections platform to promote the event to educators and parents and carers. The Ambassador also promoted the events via radio interviews. The series received 677 registrations on DART Connections, 466 live views and 2,495 total views at the end of the evaluation period. These events were not directly linked to gender equity messaging, however they promoted Professor Harvey-Smith’s role as the Women in STEM Ambassador among carers and educators and answered children’s questions about being an astrophysicist.

STEM story time

STEM story time was the third activity, supported by Questacon, the National Science and Technology Centre. STEM story time featured a space-themed adventure video which challenged STEM stereotypes and a hands-on activity aimed at children aged 3-6 as well as information resources on challenging STEM gender stereotypes for parents and carers. As part of the package, the Office also created a guide to enable libraries and early educators to deliver the video and activity as an in-person or virtual workshop. We also collaborated with Professor Marilyn Flear at Monash University, who developed a pop-up STEM conceptual PlayWorld to complement STEM story time, based on the book “How to Catch a Star”.

STEM story time is an engaging resource which addresses a gap by communicating gender equity in STEM messages to early learners and parents. STEM story time received 430 views, with 2,590 unique webpage visits and 50 downloads of the resources. City of Darwin, Maribyrnong and Melton libraries and Marrickville Goodstart early learning centre delivered a STEM story time workshop, reaching a reported 41 children. Questacon showed the video on the release day as part of the ‘Mission to Mars’ tour, which was well-received by that audience of 15 parents and young children. The offering was promoted by Community Early Learning Australia, the State Library of Western Australia, State Library of Queensland and Early Childhood Australia.

When asked which strategies parents/carers were likely to implement at home to challenge gender stereotypes and bias, respondents indicated that they were likely to point out more women role models in STEM and do more problem-solving activities with children.

Priority Area 3: Advocate for gender equity in STEM

An important role of the Ambassador is to increase awareness of women in STEM issues and engage with stakeholders across the sector to promote action to address gender inequity. It is intended that through the Ambassador’s engagement, STEM stakeholders are aware of and respond to gender equity in STEM issues.

To assess this priority area, the evaluation tracked and measured the influence of the Ambassador’s interactions and engagement with stakeholders in raising awareness and addressing gender inequity.



Image of tweet showing carer and child engaging with the STEM story time space helmet building activity.



Women in STEM Ambassador

The Ambassador has garnered support from the STEM community and grown her involvement in policy advisory work as recognition of her role as a leader in gender equity has expanded. Thirty-one percent of all activities (excluding radio, TV and online media) aligned with the priority 'Advocate for gender equity in STEM'. The Ambassador's increased involvement in expert advice activities and meetings in 2020 is evidence of growing awareness of the Ambassador's role as a trusted voice on STEM gender equity issues and reflects the efforts of the Office in fostering strategic relationships with important leaders and organisations in Australia over the Ambassador's first term (Figure 1).

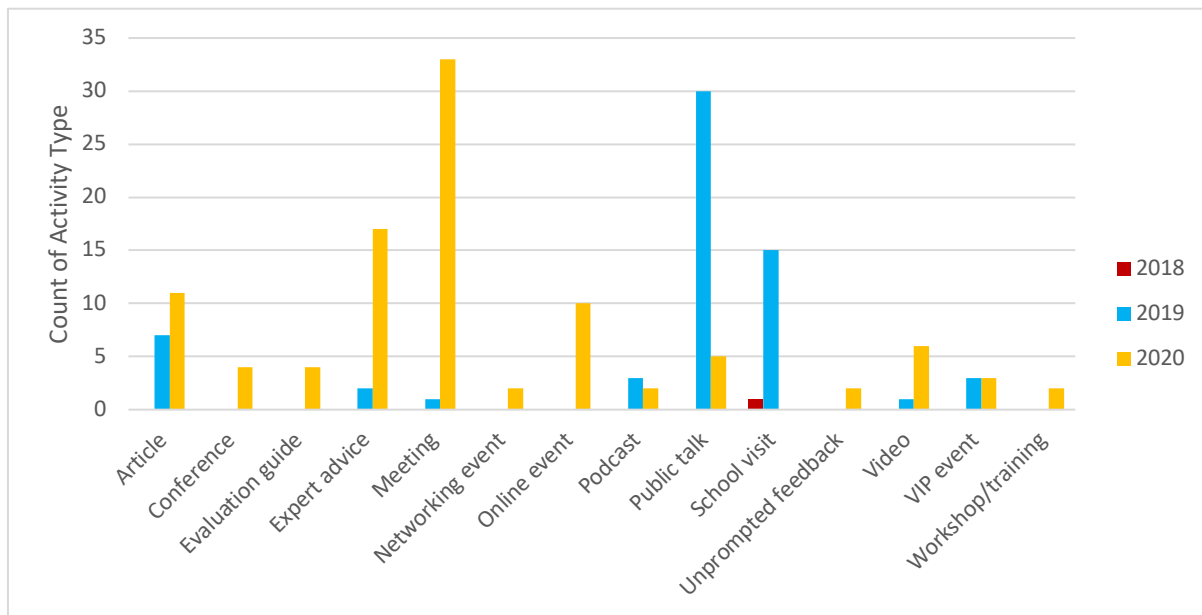


Figure 1 Graph showing types of tracked engagement activities by year. Public talks and school visits were the predominant type of engagement in 2018-19, while expert advice and meetings became the most frequent activity in 2020.

A critical outcome of this initiative is that the Ambassador is established as a leader and sought as a knowledge authority on gender equity issues affecting women in STEM. This is evidenced by the Ambassador's involvement in various responses to the COVID-19 pandemic's impacts on women in STEM, participation in working groups and invitations to meetings of committees. Notable engagements included meetings with the National Science and Technology Council, the National COVID Coordination Commission, the Women in STEM Advisory Council roundtable and the Forum of Australian Chief Scientists.

Impact of COVID-19 pandemic on women in STEM

In response to the impact of the COVID-19 pandemic on women in STEM, the Office provided advice and recommendations to the former minister for Industry, Science and Technology the Hon Karen Andrews MP and the Department of Industry, Science, Energy and Resources (DISER) on ways to support women in STEM in COVID-19 economic recovery.

The Ambassador and the Office collaborated on two research reports on the impact of the COVID-19 pandemic on women in the STEM workforce, aimed at leaders and policymakers. The Office contributed as co-authors to a Rapid Research Information Forum Report which presented evidence on the impacts of the COVID-19 pandemic on women in the STEM workforce, prepared for The Hon Karen Andrews MP.

As a member of the Gender Strategy Group, the Ambassador collaborated on recommendations for actions that governments and business should take to promote gender



equity as a tool for Australia's economic and social recovery from the COVID-19 pandemic. Members of the Gender Strategy Group include the eSafety Commissioner, the Sex Discrimination Commissioner, the CEO of OurWatch and the CEO of Australia's National Research Organisation for Women's Safety. The paper was developed in consultation with the Office for Women in the Department of Prime Minister and Cabinet and the Ambassador for Gender Equality in the Department of Foreign Affairs and Trade.

The report, *Better Decisions, Better Futures*, synthesized research on the gendered impacts of the COVID-19 pandemic and provided recommendations to remove structural barriers to women's full participation in the workforce in Australia's economic recovery from COVID-19. It was distributed to relevant State and Territory Ministers, Premiers, Federal Ministers and the Prime Minister's Office. The report received media coverage in the *Australian Financial Review*, *SBS News*, *ABC Radio National*, *The Drum* and *Sydney Morning Herald/The Age*.

Recommendations from the report fed into the Australian Public Service Gender Equality Strategy Refresh and the National COVID-19 Coordination Commission paper on women and employment. It was also anticipated that it would influence content in the 2020 Women's Economic Statement. Professor Harvey-Smith was involved in key meetings to implement the report, including the National COVID-19 Coordination Commission and a virtual roundtable on the effects of COVID-19 on women's safety, economic security and leadership in Australia organised by the Commonwealth Office for Women.

Research collaborations and consultation

The Ambassador collaborated with Deans of Engineering at UNSW, Monash University and the Australian National University, as well as Engineers Australia and other industry stakeholders as part of the Engineering for Australia Taskforce. The Taskforce commissioned researchers from Monash Education Futures to produce a research report investigating the barriers to girls' participation in engineering and interventions to improve diversity. The report 'Barriers to participation in engineering and the value of interventions to improve diversity', analysed research literature to identify factors influencing girls' engagement with STEM and key considerations for effective interventions to encourage participation in engineering. It provides recommendations for the engineering and education sectors to improve the number of women studying tertiary engineering degrees in Australia. The Engineering for Australia Taskforce will work to action the recommendations with industry, universities and peak bodies.

The Office provided feedback on the guidelines for the 2020 Women in STEM and Entrepreneurship (WISE) grant round to ensure projects focus on creating systemic change, and input into the design of the Youth Insights survey. Additionally, the Office contributed expertise to key projects for the STEM sector including the Women in STEM Decadal Plan, the Chief Scientist's STEM workforce report, the Australian Cybersecurity Strategy and the National Skills Commission National Skills Priority List.

Office of the Women in STEM Ambassador projects

In this grant, the Office has planned and commenced two ongoing projects which are anticipated to be highly valuable to the STEM community to attract, retain and progress women in STEM careers. The Women in STEM Decadal Plan highlighted over 330 women in STEM programs in Australia, few of which have publicly, formal evaluations. The Plan identified the need for national evaluation guidelines to determine 'what works' for women in STEM.

In response to this, the Office developed a guide, *Evaluating STEM Gender Equity Programs: a guide to effective program evaluation*. The first iteration of the guide was downloaded 294 times nationally and internationally. The Guide was piloted by WISE grant recipients and stakeholders, and 41 users' feedback was collected via survey. The feedback was integrated



into a final Evaluation Guide which was published in December 2020. The Guide has been endorsed by DISER as a recommended resource for evaluation of WISE grant funded projects in 2021. The Evaluation Guide is part of the National Evaluation Guidelines action in the Australian Government's women in STEM *2020 Action Plan*. The Guide is a first step to determining which interventions are effective by guiding programs to undertake valuable, consistent evaluation.

The Research Associate in the Office of the Women in STEM Ambassador designed a study of anonymised review in the application processes for allocation of research resources, and engaged with key national research organisations to participate. Four national research organisations (CSIRO, ANSTO, Astronomy Australia Limited, National Computational Infrastructure) have implemented significant, lasting changes to their systems and procedures to anonymised grant applications and reviews. The project is ongoing, with the aim to submit the study for academic publication in 2022. The study of anonymised review will provide evidence-based measures that STEM organisations can implement to reduce the impacts of unconscious bias on women in STEM. The study is a key action in the Australian Government's Advancing Women in STEM strategy and 2020 Action Plan.

Priority Area 4: STEM careers

The final priority of the Ambassador is the extent to which activities are attracting women to STEM careers and supporting the sector to address inequities to retain women in STEM fields. The key outcomes are (1) through interactions with the Ambassador, women perceive STEM careers as interesting, feasible and sustainable and (2) organisations within the sector are implementing, monitoring and evaluating actions to enhance women's retention.

The Ambassador's public engagements reached 12,650 STEM professionals and representatives from industry, university and STEM research organisations. Events held by the Office supported this priority, with 90% of respondents agreeing that they were more interested in STEM jobs after listening to the Super STEM Careers Q&A speakers. Of the Ambassador's total public speaking engagements:

- 46% had the key message of 'gender equity in the workplace'
- 31% mentioned the importance of an evidence-based approach in gender equity activities
- 29% talked about STEM career pathways
- 31% mentioned the Women in STEM Decadal Plan, Science in Australia Gender Equity or the Champions of Change Coalition (formerly Male Champions of Change), which are key programs in Australia aimed at retaining and progressing women in STEM careers.

The Ambassador's advocacy work described in the previous section aims to positively impact the quality of STEM careers for women through influencing leaders and decision makers in the STEM sector and driving systemic change. In addition, the long-term impacts of the Evaluation Guide are to improve the knowledge base of effective programs for attracting and retaining women in STEM. The study of anonymised review also aims to promote retention of women in STEM by improving equity in the allocation of research resources. These projects are continuing and the outcomes and impacts on the sector will be analysed in future evaluations.



Conclusions

Evaluation questions and findings

The Women in STEM Ambassador is a unique and valuable initiative to coordinate efforts to address gender equity in STEM, encourage and empower girls to pursue STEM study and careers and advocate for systemic and cultural change across the sector to retain women in STEM.

In her first term, the Ambassador has built an effective team to support her advocacy and deliver key projects addressing gaps in the women in STEM pipeline and aiming to create systemic change for the STEM sector. The Ambassador has developed relationships with a range of relevant stakeholders including government departments and agencies, science teacher's associations, STEM education programs and providers, STEM gender equity initiatives as well as STEM industry and research organisations.

The four priority areas and target audiences were utilised in a matrix structure to underpin engagement. The Ambassador has delivered four effective events targeting children, parents and carers and educators. Her public engagement activities have been strongly focussed on engaging educators and the STEM community. The activities of the Ambassador have aligned with the program outcomes and have driven progress towards achieving these outcomes and tracking towards positive impact.

The change in the type of the Ambassador's engagements from predominantly public speaking engagements to providing expert advice and contributing to policy discussions indicates the growth of the role into a sought knowledge authority and recognition of the Ambassador's valuable contributions by the STEM community and gender equity leaders (Figure 2).

The Ambassador's unique role has received international interest, with the Ambassador engaging with gender equity and STEM stakeholders in Europe, the UK, New Zealand, Japan and the US, affirming Australia's position as a leader in gender equity in STEM.

The main question this evaluation seeks to answer is: **“To what extent have the STEM gender equity attitudes and behaviours of Australians changed as a result of interaction with the Women in STEM Ambassador?”**

The following supporting questions assist in addressing the main evaluation question:

To what extent has the WISA changed perceptions of women in STEM in Australia?

The Ambassador's activities contribute to answering this evaluation question through engaging directly with women students (e.g. through the Super STEM Careers Q&A), profiling real-life women in STEM role models, supporting and collaborating with women in STEM initiatives such as the Girls in STEM Toolkit and STEM Women, and communicating to women in STEM audiences through outlets such as the *Women's Agenda* and *The Conversation*. Progress towards outcomes of improving perceptions of attractiveness of STEM careers and empowering girls to pursue these careers is positive, and as the WISA initiative grows in maturity future evaluation will provide insights as to the extent of the change in perceptions.

Additionally, the Women in STEM National Awareness Raising initiative, 'Future You' program contributes to improving the perception of careers as being for men and women equally among children aged 8-12 and their parents and carers. This initiative is evaluated separately to the WISA initiative, however is led by the Ambassador.



What actions and behaviour change has occurred amongst Australians as a result of the Ambassador's activities?

The engagement activities delivered by the Ambassador, targeted at parents and carers and educators were aimed at equipping these audiences with tools to address gender stereotypes and bias in STEM. Evidence from these activities suggests intention by program participants to implement some of the suggested strategies at home and in the classroom.

The Ambassador's advocacy in areas such as the impact of the COVID-19 pandemic on women in STEM has led to response and actions taken forward by leaders and policy-makers. Work to influence action among STEM research and industry organisations is on-going, however the Ambassador continues to engage with organisations such as Science in Australia Gender Equity, the Workplace Gender Equality Agency, the Australian Human Rights Commission and the Champions of Change Coalition to support achievement of this goal.

To what degree has the Ambassador influenced national discussion about gender issues in STEM?

The issues facing women in STEM are well-defined and researched. The Ambassador's work has helped shift the conversation around gender equity in STEM to promote action, enable educators and hold STEM organisations accountable to implement effective measures, thereby cultivating systems that support women to stay in STEM careers, addressing obstacles to career advancement, and empowering all girls to pursue STEM study and access opportunities.

The Ambassador's role in promoting the goals of the Women in STEM Decadal Plan and Advancing Women in STEM strategy, as well as evidence-based communication and advocacy in a range of forums on issues affecting women in STEM is evidence of her growing profile as a voice for women in STEM. The growth of the Ambassador's national profile through media and consistent key messaging regarding equity in STEM across activities is supporting strategic communication and discussions among specific audiences.

In what ways is the Ambassador affecting systemic change to support an increase of women in STEM?

This evaluation question is met by projects, advisory and advocacy activities. The implementation of the Evaluation Guide will enable women in STEM programs to achieve quality evaluation of their projects, with the ultimate outcome to establish a knowledge base for effective programs to improve women's participation in STEM. The anonymised review study implements systemic measures which address the biases that impact the award of research resources. Further evaluation of the impact of the evaluation guide and study will be possible as these projects progress through the Ambassador's next term.

The Ambassador has also advised government and gender equity initiatives on ways to create systemic change. For example, consulting on the Women in STEM and Entrepreneurship grant guidelines to focus government funding on programs that aim to create systemic change.

Recommendations

The following recommendations are informed by the evaluation and provide suggestions to meet targets and outcomes:

- Continue to use the Ambassador platform to amplify current women in STEM activities and programs. Further consideration should be given to reaching audiences who aren't already STEM-positive and engaged.

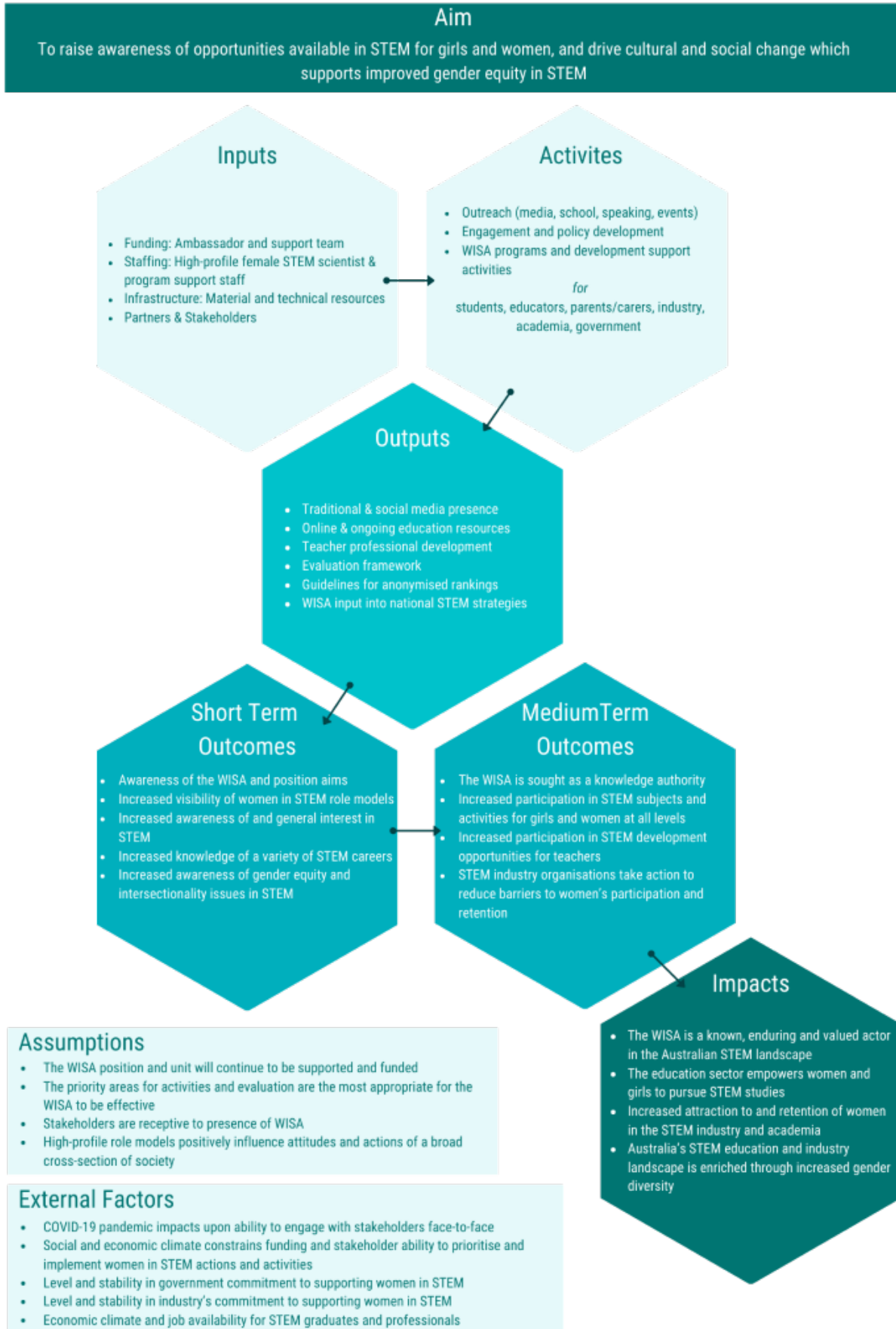


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- Promote and apply an intersectional lens when addressing the barriers faced in STEM and in advocacy activities.
- Grow the Ambassador as a sought knowledge authority among STEM gender equity practitioners and STEM organisations through targeted communication and engagement activities.
- Continued collaboration with STEM education partners to communicate to young women about STEM careers.
- Continue to grow the strategic relationships with influential organisations and leaders to further increase awareness and action towards addressing gender inequity.



Appendix 1 Program logic





Appendix 2 Indicators and targets matrix

Priority Area	Outcome	Evaluation Question	Indicators	Targets
1. Role Models	The WISA has a consistent national profile that is connected to key program messaging.	What is the extent of the WISA's public profile?	Scope of public engagements or events	Increase in # and types of engagements, compared to previous year
		How have Australians responded to and engaged with the WISA?	Types of actions taken after WISA interaction	Intention to take a range of STEM-related action as a result of WISA engagements; personal narratives of meaning evident
	Volume and content of unprompted written feedback		Unprompted feedback is positive towards the WISA (e.g. inspire, motivate, empower); indications that people will take STEM action; reflects key messages of WISA	
	The WISA profile is leveraged to publicly support other women in STEM	In what ways has the WISA amplified visibility of diverse women in STEM?	Who and number of invitations for (opportunities for uplifting of) other role models to join the WISA and participate in events	12 different STEM role models (demographic, disciplinary, geographic) are invited to join in events with the WISA
2. STEM Education	WISA interactions increase girls' knowledge about possible STEM careers, and their perception that STEM careers are interesting and achievable	To what extent do girls feel empowered and inspired to pursue a range of STEM subjects, study and careers after engagement with WISA?	Girls' engagement in STEM activities in classrooms and volunteering for extension or extra-curricular activities	10% increase in number of attendees at WISA-led activities
	Teachers and parents/carers support the WISA messaging, and provide practical opportunities for girls to explore and develop their STEM interests.	In what ways has the WISA influenced parent/carers support of STEM as a valid interest and potential career choice for girls?	Support for STEM careers as a choice for girls following a WISA event or communication	30% Increase in positive sentiment towards STEM careers for girls
		How are teachers employing the messaging, learnings and resources of WISA to provide opportunities for girls to develop STEM interests and experience?	Teacher confidence around STEM careers and reducing bias in their classrooms	40% increase in teacher's confidence in educating students about STEM careers and pathways

Priority Area	Outcome	Evaluation Question	Indicators	Targets
3. Advocate for Gender Equity in STEM	As a result of interaction with the WISA, STEM stakeholders are aware	Is the WISA positioned and perceived as an authoritative source of	Participation in key government policy decisions, expert working groups, and	Participation in all expert working groups within the STEM sector.



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	of and responding to gender equity in STEM issues.	knowledge on gender equity in STEM?	decision making bodies	
		In what ways has WISA raised awareness of issues related to gender equity in STEM?	WISA meetings that result in an action or a change	Increase in organisations ensuring their GE and diversity policies and practices are current and fit for purpose
		How is WISA supporting stakeholders to improve gender equity in STEM?	Use of WISA evaluation and impact tool	Feedback received on the use of the tool and any changes that have resulted
			Anonymised research study findings	Uptake of the findings by industry
4. STEM Careers	As a result of interaction with the WISA, women perceive STEM careers as interesting, feasible and sustainable	How has WISA influenced women's perceptions of attractiveness of STEM careers?	Current STEM professionals have a positive view/ perception of the attractiveness of a STEM career after a WISA event	20% increase in awareness, breadth and perception of the attractiveness of STEM career.
		In what ways have WISA activities enhanced the quality of STEM careers for women?	Positive personal impact following WISA events	Event and unprompted feedback (emails, messages) is positive towards the WISA (e.g. inspire, motivate, empower);
	As a result of interaction with the WISA, organisations within the sector are implementing, monitoring and evaluating actions to enhance women's retention	How is the WISA supporting STEM sector organisations to enhance women's retention?	WISA seen as a source of expert knowledge	WISA to have input into government discussion papers and policy developments