Big Sister
Advanced Mentoring SA/WA

Rapid Literature Review for Big Sister Program
November 2025

THE UNIVERSITY OF SYDNEY
Business School

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We recognise and pay respect to the Elders – past and present – of the lands on which the University of Sydney's campuses stand. For thousands of years, they have shared and exchanged knowledges across innumerable generations for the benefit of all.

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Executive summary

Women remain severely underrepresented in Australia's skilled trades, including in the electrical trades.

From early schooling onwards, gendered expectations and limited information about trade careers restrict women's exposure and confidence to pursue these pathways. Once in training or employment, women often encounter exclusionary workplace cultures, inadequate facilities, limited flexibility, and systemic bias in recruitment and advancement. Together, these factors reinforce a cycle of low entry and high attrition that sustains women's underrepresentation.

This rapid review synthesises academic, government, and industry evidence to inform the design and evaluation of the Big Sister Program – an initiative aimed at increasing women's access, retention, and progression in the electrical trades. Where trade-specific research is limited, the review draws insights from broader male-dominated sectors to identify transferable strategies. The review examines 5 interrelated areas for program design:
- School-based pre-vocational programs and outreach initiatives
- Vocational education and training (VET) environments
- Apprenticeship experiences on worksites
- Mentoring programs to support women's participation in the trades
- Collaborative partnerships to influence workplace change

Findings highlight that early, well-designed engagement programs and visible female role models can broaden perceptions of trade careers and support women's entry. Inclusive VET systems, structured mentoring, and transparent recruitment processes improve participation and learning outcomes. However, few of these approaches have been rigorously evaluated, and this evidence gap is particularly pronounced in trade-specific contexts, where program impacts are rarely examined over time.

Sustainable change depends on addressing the systemic and cultural barriers embedded in workplaces, such as transforming organisational norms, leadership behaviour, and accountability, rather than relying solely on women-focused or resilience-based initiatives. Emerging research suggests that partnership-based approaches may play a pivotal role in driving this transformation by pooling resources, aligning incentives, and enhancing the legitimacy and reach of gender equality efforts.

Overall, the evidence base specific to the electrical trades remains limited, with few interventions rigorously evaluated for impact or scalability. The Big Sister Program is well positioned to address this gap. Through rigorous and embedded monitoring and evaluation, it will generate practical evidence on how to create safe, inclusive, and sustainable careers for women in the electrical trades. The program has the potential to guide future initiatives and policy efforts seeking to drive systemic and lasting change across other trade and technical sectors.

1. Introduction

Women remain significantly underrepresented in the skilled electrical trades in Australia and internationally. In 2025, women comprise just 2.6 per cent of the qualified electrician workforce in Australia (ABS, 2025), reflecting a persistent gender imbalance. This pattern mirrors international trends, with women accounting for only 1 to 5 per cent of electrical workers across comparable economies (ONS, 2025; BLS, 2024; Limani and Södergren, 2023). Although progress has been gradual, there are emerging signs of change (Powering Skills Organisation, 2024). In Australia, the share of qualified women electricians has more than doubled over the past two decades - from 1.2 per cent to 2.6 per cent (ABS, 2025). Recent training data also indicate meaningful improvement. Women's completions of electrical apprenticeship training rose from 2.2 per cent in 2019 to 4.0 per cent in 2023, while enrolments increased from 3.4 per cent to 5.5 per cent over the same period (see Figure 1; NCVER, 2024). In 2024, women represented 7.5 per cent of new apprentice entrants, totalling around 1,000 apprentices nationally (NCVER, 2024).

Figure 1. Share of women in electrical workforce and apprentice training Australia: 2019 - 2023

Source: NCVER (2024a; 2024b); Australian Bureau of Statistics (2025)
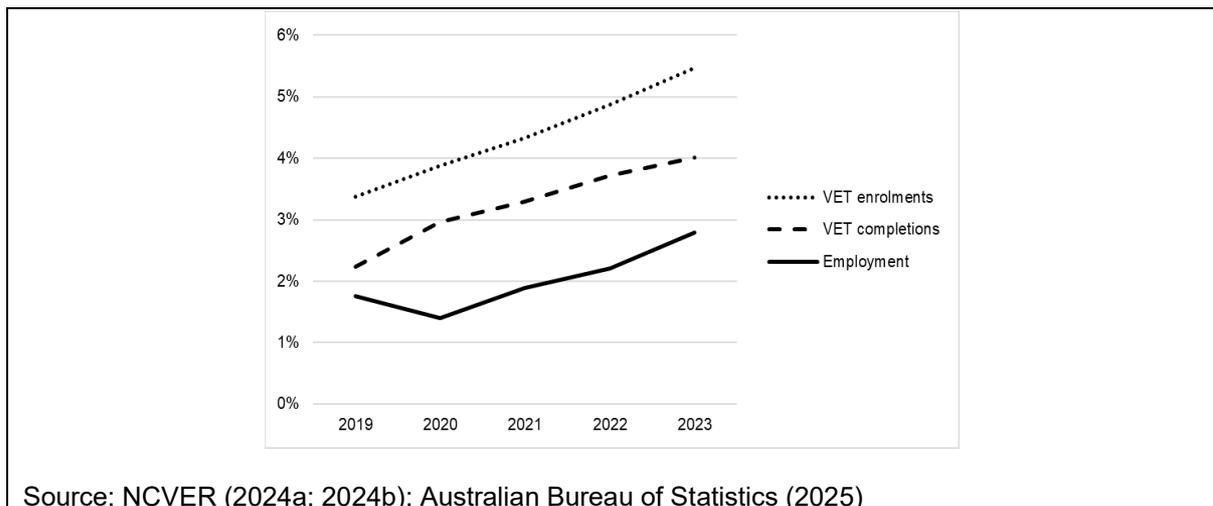
Addressing this gendered underrepresentation is both an equity imperative and an economic necessity for women and for the national economy. The electrical trades offer well paid, secure and meaningful work with strong long-term demand, and the skills they require are central to Australia's clean energy transition (Jobs and Skills Australia, 2023, 2025). Expanding women's access to these skilled jobs strengthens economic security and supports national goals for industry development, workforce participation and gender equity (Commonwealth of Australia, 2024). For employers, a more gender diverse trades workforce broadens the supply of skilled labour and fosters more respectful, collaborative and effective workplaces (Menches and Abraham, 2007; Jones et al., 2017; PSO, 2024). Taken together, broader participation contributes directly to workforce sustainability, productivity and national policy priorities.

This rapid literature review synthesises academic, industry and government research on women's participation in the electrical trades workforce and training ecosystem to inform the design and evaluation of the Big Sister Program. Where evidence specific to this workforce and training context is limited, insights are drawn from related male-dominated trades and adjacent workforces. Section 2 summarises research findings across five thematic areas that align with the focus and design of the Big Sister Program. These areas

capture key stages and influences shaping women's participation and progression in the electrical trades, including:

– School-based pre-vocational programs and outreach initiatives
– Vocational education and training (VET) environments
– Apprenticeship experiences on worksites
– Mentoring programs to support women's participation in the trades
– Collaborative partnerships to influence workplace change

2 Review of published research on gender dynamics in the electrical trades

2.1 Methodology and search strategy

The rapid review draws on peer-reviewed academic research supplemented by non-peer-reviewed government, industry, union and advocacy organisation research and evaluation reports. The research team searched several academic databases, including Business Source Ultimate, ABI/Inform, Sociology Source Ultimate, Scopus, and Google Scholar, using search terms such as 'gender equality' and 'electrician' or synonyms such as 'gender inclusion' and 'trades', combined with terms related to strategies, initiatives and evaluations. Several searches were conducted to capture research on specific components of the Big Sister Program, including searches on the design and evaluation of mentoring programs and research on stakeholder collaboration and partnership to driver gender equality.

Academic papers were included if they were peer-reviewed, written in English, and focused on relevant contexts such as electrical trades training and work, work and training in male-dominated skilled trades. To ensure comparability, only studies drawing on data from Australia, New Zealand, the United Kingdom, the United States, Canada, Western Europe, or those providing a global overview were included. Studies that did not meet these criteria were excluded.

The search strategy was conducted in two main parts, covering both academic and non-academic sources across five key areas. The first part examined drivers of women's underrepresentation, beginning with studies focused specifically on the electrical trades and then expanding to male-dominated skilled trades and other male-dominated workforces due to the limited available research. The second part explored themes informing the design of the Big Sister Program, including studies on mentoring programs, mentoring in male-dominated sectors more broadly, and collaborative interventions for workforce change.

The same structure was applied to non-academic sources, incorporating reports and public data. We used Google Scholar, citation tracking, and expert input from industry and government experts. A summary of the search scope and findings is provided in Table 1. Together, these studies and reports form a foundational evidence base for understanding effective strategies to improve gender equality in the Australian electrical trades.

Table 1. Summary of Search Strategy and Sources Reviewed and Underpinning this Work

Part	Focus area	Search description	Number of peer reviewed papers	Number of non-academic sources
1. Understanding drivers of women's underrepresentation	Electrical trades	Targeted studies on women's entry pathways, training, and workplace experiences in the electrical trades.	4 papers (3 Australian 1 international)	5 papers
	Male-dominated skilled trades	Broadened search to male-dominated trades addressing entry, training, and workplace experiences.	31 papers	19 papers
2. Informing the design of the Big Sister Program	Mentoring programs	Examined studies on the design and evaluation of mentoring programs in the electrical trades	3 papers	0 papers
	Male-dominated mentoring programs	Expanded search to mentoring programs for women in male-dominated sectors more broadly.	8 papers	4 papers
	Collaborative interventions	Reviewed sources on collaborations between governments, unions, training organisations, and employers.	7 papers	4 papers

Note: 6 sources of data were also used from relevant national and industry databases and reports

2.2 Literature review findings

This section reports on the 5 themes we identified from the research on gender equality in skilled trades. Each theme directly aligns with the design and operation of the Big Sister Program, including:

- School-based pre-vocational programs and outreach initiatives
- Vocational education and training (VET) environments
- Apprenticeship experiences on worksites
- Mentoring programs to support women's participation in the trades
- Collaborative partnerships to influence workplace change

1. School-based pre-vocational programs and outreach initiatives

School-based educational experiences and career guidance are critical in shaping young women's perceptions of and access to skilled trades. Before entering training or employment, many are deterred by gendered expectations, limited exposure to trade-related learning, and a lack of visible female role models. Addressing these early barriers is essential to increasing the supply of women entering electrical and other male-dominated trades. This section examines how school-based pre-vocational programs and outreach initiatives can expand awareness, challenge stereotypes, and build young women's confidence and interest in trade careers. It also reviews evaluated approaches and identifies key lessons for designing inclusive and effective early engagement strategies.

Dynamics and drivers of the problem

Families and schools often discourage young women from pursuing electrical and other skilled trades, shaping their career aspirations and contributing to persistent gender imbalances in these industries. This pattern extends beyond the trades to other male-dominated professional sectors, such as engineering and technology. Career counsellors play a key role in shaping students' early career choices, yet persistent gendered perceptions, limited awareness of inclusive opportunities in the trades, and insufficient information about career pathways can inadvertently discourage young women from pursuing these sectors (Carnemolla and Galea, 2021; Francis and Prosser, 2013; Moore, 2006).

Limited exposure to trades-related learning, combined with stereotypes of VET pathways as low status and inferior to academic routes, further reduces the likelihood that female students will enter these occupations (Butler et al., 2014; Carnemolla and Galea, 2021; Clarke and Volkoff, 2012; Jones et al., 2017). Male-dominated and unwelcoming training environments reinforce this exclusion before career entry by signalling that trades are unsuitable for women and restricting access to female role models (Butler and Ferrier, 2000; Carnemolla and Galea, 2021; Jones et al., 2017).

Strategies to address the problem

Research highlights school-based pre-vocational programs and outreach initiatives as effective strategies to address early barriers and increase young women's awareness of and participation in male-dominated trades. While some of these strategies are proposed as promising interventions, others have been systematically examined and evaluated. Key approaches include early, and staged, career exploration initiatives supported by well-trained, impartial career advisors, and short 'taster' programs with work placements that provide practical exposure to trades roles and allow students to explore their interests

(Simon and Clarke, 2016). These programs aim to increase understanding of career opportunities, provide hands-on experience and build confidence in pursuing trades careers (Simon and Clarke, 2016).

Complementary strategies include locally informed careers programs featuring talks from industry representatives, particularly women, which enhance the visibility and relevance of trades pathways and broaden students' perceptions of potential roles and increase access to female role models (Francis and Prosser, 2013; Simon and Clarke, 2016). Further recommendations emphasise partnerships with industry professionals, such as engineers, architects and contractors, to actively engage students and increase awareness of the breadth of career options open to them (Menches and Abraham, 2007; Simon and Clarke, 2016).

Additionally, collaboration between schools and career advisors can ensure more inclusive guidance, and support informed and equitable career decision-making for female students. For example, research suggests that educating and collaborating with advisors can help to expose the diverse career paths in construction, including roles in business development, project management, and estimating (Francis and Prosser, 2013; Moore, 2006, cited in Menches and Abraham, 2007).

Evaluated approaches

Evaluated pre-vocational programs offer valuable insights into strategies that can increase young women's engagement in male-dominated trades. For example, the ACE Mentor Program in the United States pairs students with industry professionals from architecture, construction, and engineering disciplines - including electrical engineering - to provide early career guidance in these fields. The program provides mentorship, site visits, and career exposure. Evaluations showed that 92% of graduates pursued higher education and over 80% entered ACE-related majors, indicating that the program effectively increases both educational attainment and interest in these careers (ACE Mentor, 2007; Menches and Abraham, 2007).

Similarly, the Canadian female Automotive Service Technician Pre-apprenticeship program uses gender-sensitive entry assessments, a skills and development module, gender-aware instructors, work placements, coaching, and access to supportive employers. Students reported very positive experiences, particularly valuing staff support and guidance, with many describing the program as 'life-changing' (Maher and Atack, 2011). However, some participants noted limitations of the women-only format, suggesting greater interaction with male peers and earlier integration of co-educational elements could improve outcomes.

Despite these promising examples, few pre-vocational programs have been rigorously evaluated, and evidence remains very limited for interventions specifically targeting the electrical trades.

Summary and implications

Pre-vocational strategies, including staged career exploration, taster programs, mentorship, and exposure to female role models, show promise in increasing young women's awareness, confidence and interest in male-dominated trades. Evaluated initiatives, such as the ACE Mentor Program and Canadian Pre-Apprenticeship programs, suggest these approaches can prepare students for skilled trade careers and encourage pursuit of related study pathways. However, few programs have been rigorously evaluated, and more research is needed to determine which strategies are most effective in encouraging young women to pursue electrical and other skilled trades. This evidence gap highlights the

importance of the Big Sister Program, which aims to test scalable, evidence-informed interventions.

2. VET training environments

The VET system is the main pathway into electrical trades, making it a crucial setting for addressing gender inequality from entry. While it provides opportunities to gain technical skills and recognised qualifications, the VET environment also reflects many of the cultural and structural barriers found more broadly in male-dominated workplaces. How training is designed, delivered, and experienced strongly influences women's entry, retention and success in these fields.

Dynamics and drivers of the problem

The VET environment is the door into electrical and other skilled trades, shaping who enters, who stays and who succeeds. Students of all genders face barriers such as time constraints, financial pressures, inflexible or outdated training structures, and low-quality, compliance-driven programs that often fail to deliver meaningful skills or improved job prospects (Butler and Ferrier, 2000; Pocock et al., 2011). Women's participation in vocational training is further constrained by masculine norms and design assumptions, including male-oriented facilities, limited consideration of childcare, experiences of sex-based harassment, and managerial resistance (Butler and Ferrier, 2000, p. 36).

Training systems have historically assumed a young, white, able-bodied male apprentice, leaving little room for others (Butler and Ferrier, 2000; Pocock et al., 2011). As a result, young women often face gendered assumptions and behaviours that reflect male-dominated worksites, fostering a hostile educational culture (Bridges et al., 2019; Butler and Ferrier, 2000; Jones et al., 2017). In these environments, male apprentices and trainers frequently reproduce worksite-style behaviours, such as monopolising tools, joking in a sexist way, or questioning women's competence in ways that reinforce gendered hierarchy and further exclude, marginalise and discourage female students (Bridges et al., 2020; Jones et al., 2017).

In line with this, an Australian study of women in electrical trades found that around one-third of participants reported negative experiences with Registered Training Organisations (RTOs) due to gendered behaviours and exclusionary, male-dominated cultural norms (Jones et al., 2017). These patterns show that gender inequality in VET stems from peer culture as much from system design, making attention to both the starting point for reform.

Strategies to address the problem

Educators and trainers play a central role in shaping inclusion within electrical and other skilled trades training environments. Inclusive education and classroom practice are critical foundations for gender equality in VET. Interactive, conversational and hands-on, practical instruction can build students' confidence, foster a sense of belonging, and challenge gendered stereotypes in learning environments (Bridges et al., 2019, 2022; Jones et al., 2017). Evidence shows that enforcing zero tolerance for disrespectful behaviour and adopting diverse teaching methods improves engagement and creates more equitable classroom experiences (Bridges et al., 2019, 2022; Ray and Zeretsky, 2022; Simon and Clarke, 2016; WHISE, 2025). Increasing the visibility of female teachers and mentors within training environments is also crucial, as they help normalise women's participation, provide aspirational role models, and support retention in male-dominated trades (Bridges et al., 2019).

Flexible and supportive learning pathways are equally important for women balancing training with work and family responsibilities. Research highlights that flexible, low-cost and work-integrated training options increase participation, particularly when programs are offered online, through blended delivery, or at accessible locations near public transport (Pocock et al., 2011; Ray and Zeretsky, 2022; WHISE, 2025). Participation and qualification completion are further supported by wraparound supports, including career navigation advice, income assistance, and job search guidance (Pocock et al., 2011). Employer involvement is also crucial in linking training to meaningful work opportunities, with support through predictable hours, mentoring, and clear career pathways enhancing retention.

Finally, institutional and industry alignment ensures that inclusion is embedded beyond individual classrooms. Active industry engagement and close alignment between training content and workplace requirements help ensure that learning translates into sustainable employment outcomes (Pocock et al., 2011; Simon and Clarke, 2016; Smith, 2006). Embedding gender equality within institutional practices, including appointing equality representatives, delivering staff and student training, maintaining clear reporting systems, and demonstrating leadership commitment, reinforces inclusion and supports equitable participation (Bridges et al., 2019, 2022; WHISE, 2025).

Together, these findings show that inclusive pedagogy drives engagement, while supportive structures and institutional culture sustain women's access, participation and long-term success in male-dominated trades.

Evaluated approaches

A national Australian study of VET, traineeship, and apprenticeship programs found that enterprise-delivered, nationally recognised training improves women's access to structured, credentialed learning (Smith et al., 2006), especially for part-time and casual employees who historically face limited training opportunities (Vandenheuvel & Wooden, 1999). This disparity arises from the uneven distribution of training across companies and workers, with permanent and more qualified employees typically receiving more opportunities - groups in which women are disproportionately represented (Smith et al., 2006).

Trainees valued the chance to gain qualifications through their workplace, suggesting this approach can create more accessible and supportive training environments. However, the study also highlighted considerable variation in training quality and depth, with some programs described as repetitive or narrowly task-focused, underscoring the need for stronger quality assurance mechanisms (Smith et al., 2006). Despite these insights, rigorous evaluations of VET interventions remain rare, and there is limited evidence identifying which approaches are most effective in increasing women's participation, particularly within the electrical trades.

Industry evaluations

An evaluation of the VET training environment for women in manufacturing, by Chisholm Institute's Engineering and Manufacturing departments in Victoria, in collaboration with Women's Health in the South East (WHISE, 2025), used a Gender Impact Assessment (GIA) approach to identify and address barriers to women's participation and progression. The GIA followed a structured four-stage process – defining problems, understanding context, creating options, and formulating recommendations – to uncover how gendered assumptions, bias, and cultural norms shape women's experiences. It identified entrenched sexism, gender segregation, and social isolation as key issues within student and workplace cultures. After implementing evidence informed interventions guided by the GIA, including cultural change initiatives, targeted capacity building, industry engagement, and enhanced student support, female qualification completion rates more than doubled, rising from 40%

in 2022 to 84% in 2024. This shows how a structured, evidence-informed approach can significantly improve inclusion and retention for women in manufacturing training.

Summary and implications

Gender inequality in electrical and other skilled trades persists due to entrenched cultural norms and inflexible systems. While inclusive pedagogy, structural flexibility and institutional commitment can enhance women's access, participation and retention, these strategies are often inconsistently applied and rarely rigorously assessed. Emerging evidence, from enterprise-based training initiatives to intervention with a GIA lens, shows that targeted, context-specific approaches can improve women's experiences and outcomes. However, the lack of robust evaluations, particularly within the electrical trades, constrains understanding of what constitutes effective and sustainable change. Initiatives such as the Big Sister Program are therefore vital for building the evidence base for 'what works' to create genuinely inclusive and supportive environments for women in electrical training.

3. Apprenticeship experiences on worksites

Worksites are the central learning environments of apprenticeship training, where technical skills are developed, professional identities are formed, and networks within the trade and industry are built. For electrical and other skilled trades, the worksite is not only a place of skill acquisition but also where inclusion or exclusion is most tangibly experienced. While all apprentices must navigate challenges such as high-performance expectations, complex workplace hierarchies and limited pay, women in particular encounter intersecting physical, systemic, financial and cultural barriers that can undermine both learning and belonging.

Dynamics and drivers of the problem

On-the-job learning on worksites is central to shaping the experiences and outcomes of women apprentices in skilled trades, yet these environments frequently present significant barriers. Physical conditions on worksites can be exclusionary, with inadequate facilities such as limited toilets and sanatory facilities, ill-fitting uniforms not designed for women's bodies, and personal protective equipment designed for men that compromise safety, comfort and productivity (Menches and Abraham, 2007; Onyebeke et al., 2016).

These challenges are reinforced by systemic flaws in recruitment and training structures, where informal recruitment processes often favour men and a training packages and frameworks prioritise traditionally masculine, physical and technical skills over feminised skills such as communication, precision and coordination (Bamberry et al., 2022; Berik et al., 2006; McMahon, 2025). This perpetuates a 'deficit model', in which women are expected to conform to male behaviours and norms rather than workplaces adapting to the diversity of the workforce (McMahon, 2025).

Many worksites where electricians work are shaped by exclusionary masculine cultures, and incidents of harassment, intimidation and physical or sexual violence have been documented by researchers (Bamberry et al., 2022; McMahon, 2025). Everyday behaviours, from sexist jokes and stereotyping to exclusion from key learning opportunities, reinforce these norms, and weak accountability combined with inconsistent employer oversight allows them to persist. Group Training Organisations (GTOs) can help mitigate these risks through structured placements, monitoring, and pastoral support (Bamberry et al., 2022). However, they can inadvertently reproduce gender bias when they fail to challenge existing workplace processes and attitudes, becoming reactive rather than proactive in promoting equality (Bamberry et al., 2022). This lack of active engagement can reinforce existing patterns of gendered inequality within host employers. Collectively, these

physical, systemic, financial and cultural barriers highlight the urgent need for targeted interventions to create safer, more inclusive, and equitable worksite environments for women apprentices.

Strategies to address the problem

Proposed strategies to improve the worksite experiences of women apprentices in electrical and other skilled trades emphasise structural and cultural change rather than individual solutions. Creating safe and inclusive workplaces is fundamental. This includes access to PPE, uniforms and facilities designed for women, gender aware work health and safety audits, and mandatory safety standards (Menches and Abraham, 2007; WHISE, 2025). Screening host employers before placements helps ensure apprentices enter supportive environments, while strengthened oversight and reporting mechanisms for GTOs and employers increase accountability and provide pathways for apprentices to transfer if needed (Bamberry et al., 2022). Inclusive HR practices, such as transparent task rotation, formal mentoring, flexible work arrangements and independent onsite contact officers, further promote equitable participation and progression (Bridges et al., 2019).

Resources and training for employers can improve understanding of health, safety and anti-discrimination obligations to women apprentices, supported by regulatory or funding requirements to reinforce compliance (Bamberry et al., 2022; WHISE, 2025). Joint governance models, including union–management partnerships and site level committees, support ongoing monitoring of safety, inclusion and learning opportunities (Berik et al., 2006). An intersectional approach is essential, recognising that women of colour, older apprentices, workers with disability and those with care responsibilities, face compounded barriers and must be explicitly considered in interventions (Berik et al., 2006; Srikanth et al., 2024).

Many initiatives aimed at increasing women's participation still adopt a deficit model, focusing on 'fixing women' through mentoring, pre apprenticeship programs or confidence building, rather than addressing the structural and cultural barriers that constrain opportunities (McMahon, 2025). True progress requires shifting the focus from women's resilience to transforming workplace behaviours, norms and expectations. Effective strategies should explicitly target male apprentices, supervisors and peers, with clear behavioural standards, leadership modelling and accountability frameworks that make respect, inclusion and safety central. By reframing interventions in this way, apprenticeship programs can create environments where women are fully supported to succeed without being expected to conform to male dominated norms.

Evaluated approaches

Berik and colleagues (2006) analysed individual level data from the US Department of Labor to examine women's entry and completion in construction apprenticeships. They found that when unions were actively involved in organising apprenticeship training -through joint apprenticeship programs co-sponsored by unions and contractors - outcomes improved significantly. Jointly sponsored programs achieved significantly higher female participation among new apprentices and completion rates nearly three times greater than those in employer-only programs, which in turn faced much higher cancellation rates. This provides strong evidence that structured, collective oversight and program delivery support women's retention and progression in male dominated trades, and that systemic supports are more effective than individual focused interventions alone.

Complementary evidence from Australian studies indicates that gender aware Group Training Organisations (GTOs) can enhance safety, confidence and retention by providing

structured oversight, mentoring and pathways for apprentices to transfer to a different employer when needed (Bamberry et al., 2022). However, these findings are primarily drawn from qualitative evaluations based on observational and testimonial data.

Overall, evaluated approaches remain limited, and few studies specifically examine electrical trades. This gap creates a clear opportunity for the Big Sister evaluation to generate new evidence focused on this context.

Industry evaluations

As previously discussed, the Chisholm WHISE Gender Impact Assessment (2025) demonstrates how structured gender audits, targeted training and leadership accountability can improve outcomes for women in male-dominated trades, with female students' completion increasing from 40% in 2022 to 84% in 2024.

Summary and implications

Worksites are the key setting where inclusion, safety and belonging are either fostered or undermined, making them central to any strategy addressing gender inequality. Evidence indicates that meaningful change requires transforming men's behaviour and organisational culture, rather than relying on women to withstand exclusion.

Practical measures, such as redesigning physical spaces, enforcing behavioral standards, embedding accountability and providing structured mentoring, show early promise in improving retention and safety. However, evaluations remain sparse, particularly in electrical trades, leaving a limited evidence base for effective interventions. This highlights the critical role of initiatives like the Big Sister Program to generate tested models of change.

4. Mentoring programs to support women's participation in the trades

Mentoring is typically understood as a developmental relationship in which a more experienced worker provides technical, career and psychosocial support to a less experienced worker (Kram, 1985). However, more contemporary approaches extend beyond this model, recognising that mentoring relationships are not always one-way or hierarchical, and support and learning can flow in multiple directions. This support is particularly valuable in work contexts where women are in the minority, helping to address barriers related to limited informal learning and professional networks. However, there is little evidence specific to the Australian electrical trades, so insights are drawn from related male-dominated industries.

Mentoring programs vary widely, ranging from individual support for women to systemic approaches that actively engage male colleagues and shape workplace culture.

This section focuses on 5 key models and their potential to enhance inclusion, skill development, and retention for women in male-dominated trades:
– formal mentoring
– informal mentoring
– collective approaches
– reverse mentoring
– supervisor-targeted mentoring.

Dynamics and drivers of the problem

Mentoring is essential in male dominated work contexts, like the trades, because entry, progression and retention are heavily shaped by informal male networks that circulate opportunities, information and career support (Hammarén and Johansson, 2014; Jones et al., 2017). These informal networks, built around shared experiences and masculinity and often described in the research as 'homosocial networks', perpetuate cycles of advantage that reinforce male dominance and limit women's access to equivalent opportunities, a pattern observed across related sectors such as construction (Galea, 2018; Galea et al., 2023). Access to these networks is often inherited. Women who have family or friends already working in the trades are more likely to enter and persist, because informal pathways are opened to them through established relationships (Wulff et al., 2022). This underscores how powerful network effects are in shaping career trajectories and why women without these connections encounter greater barriers.

Women frequently report exclusion from these networks and limited access to mentors, sponsors and career guidance as major barriers to progression (Cech and Blair Loy, 2010; Lutter, 2015). The challenge is intensified by the absence of a critical mass of women in trades, which reduces opportunities for peer support, visible role models and informal mentorship (Bridges et al., 2019; Durbin et al., 2022; Smith, 2013).

Mentoring programs have emerged to address these inequities by providing structured relationships that combine technical guidance, career advice, and psychosocial support. These programs can compensate for exclusion by helping women navigate barriers and build skills, or they can take a transformative approach by engaging male peers, supervisors and workplace cultures to challenge the behaviours and practices that sustain inequality.

Mentoring strategies and models to address the problem

Mentoring in male-dominated trades can be broadly understood along a continuum of focus – from initiatives designed to strengthen women's individual skills and confidence to more thorough-going programs aimed at transforming workplace cultures and leadership practices. Women-centred models primarily focus on supporting women to navigate structural and interpersonal barriers while building professional and technical competence.

Formal one-to-one mentoring programs pair senior workers with junior apprentices to build confidence, technical skills and career insight (Durbin et al., 2020; Gardiner et al., 2007; Jones, 2017; Vassallo et al., 2021). The Women in Apprenticeship Victoria Electrical (WAVE) Program exemplifies this approach, combining in-person mentoring, online learning, and workplace training to enhance confidence, motivation, and industry-specific technical skills (Ellis Jones, 2022). However, such programs can risk reinforcing 'fix-the-woman' narratives if they are not supported by broader organisational reforms addressing structural inequities and aiming to change workplace practice and culture (Vassallo et al., 2021).

Informal mentoring, such as peer circles and self-organised networks, fosters belonging, solidarity and mutual learning in male-dominated environments. These relationships tend to be more sustainable when mentees can self-select mentors, because organically developed, agency-driven connections often provide valued psychosocial support, including empathy and encouragement (Corney and Du Plessis, 2010).

Similarly, same-sex mentoring, where women mentor women, can enhance understanding, psychological safety, and the visibility of role models (Durbin et al., 2020; Dutta, 2020; Enrich and Kimber, 2016; Gardiner et al., 2007; Jones, 2017; Vassallo et al., 2021),

although effectiveness depends on it being embedded within wider inclusion efforts and is often limited by the small number of female mentors available in such environments.

In contrast, men-focused mentoring models aim to reshape workplace behaviours and cultures. Reverse mentoring, where junior or underrepresented workers mentor senior, often male, leaders, seeks to deepen men's understanding of gendered experiences and disrupt exclusionary practices (Clarke et al., 2015). Supervisor-targeted mentoring similarly reframes mentoring as an inclusive leadership responsibility, training supervisors to model equitable practices and foster supportive environments (E-Oz Energy Skills Australia, 2016). These approaches position mentoring as a lever for organisational and cultural change, illustrating that its greatest impact occurs when women's development is linked to broader transformations in how workplaces understand and enact inclusion.

Technical and interactional mentoring

Across the five models of mentoring described above, the focus, objectives and outcomes of each relationship vary, reflecting the distinct challenges faced by workers. Technical mentoring centers on developing trade-specific knowledge, skills, safety practices and productivity, ensuring that women can perform their roles with competence (Menches and Abraham, 2007; Smith et al., 2006). While this focus on professional capability is vital, technical mentoring alone rarely addresses the broader structural and cultural barriers that limit women's long-term participation and career advancement.

Without attention to workplace culture, women may acquire skills but continue to face exclusion from informal networks, everyday sexism, harassment, and unsafe or unaccommodating environments. Interactional or cultural mentoring, in contrast, focuses on fostering confidence, inclusion and resilience, helping women navigate these challenges while cultivating a sense of belonging (Dashper, 2019; Durbin et al., 2020; Jones et al., 2017). Importantly, this form of mentoring does not aim to 'fix' women to conform to masculine norms of behaviour but instead empowers them to engage with workplace challenges on their own terms, building both psychological and social resources to sustain their participation and progression in male-dominated trades (Dashper, 2019).

Research highlights that mentoring programs are most effective when they combine technical and interactional approaches. Balancing hands-on, practical guidance with personal support allows women to develop the technical skills needed for their roles while simultaneously building confidence, resilience and a safer workplace (Howe et al., 2023). Combined programs also help women overcome barriers created by male-dominated informal networks, providing structured access to professional contacts, career guidance, and ongoing support that is often less accessible through informal channels (Ellis Jones, 2022). By integrating both technical and interactional mentoring, programs foster competence, inclusion, and long-term participation, creating more respectful and equitable workplaces.

Wrap-around mentoring

Regardless of the specific mentoring model used (e.g., formal, informal, collective), its effectiveness depends on being embedded within organisational and industry systems that link individual development to broader structural and cultural change. Wrap-around or systemic mentoring describes approaches situated within frameworks that foster inclusion, accountability, and cultural safety. Rather than treating mentoring as an isolated, interpersonal intervention, wrap-around models integrate it with complementary strategies such as employer engagement, supervisor training, and structural oversight (Clarke et al., 2015).

For example, the Australian Women and Their Trade (WAVE) program combined mentoring with respect-at-work and safety training, which improved women participants' confidence, motivation, and sense of belonging in the trades (Ellis Jones, 2022).

Similarly, GTOs have been found to enhance women's retention in apprenticeships by formalising mentoring processes and introducing external accountability mechanisms (Bamberry et al., 2022). Evidence suggests that union–contractor joint apprenticeship programs achieve higher completion rates than employer-only models, underscoring the value of collective governance and shared responsibility in supporting women's success (Berik and Bilginsoy 2006). Complementing these initiatives, supervisor-targeted mentoring programs in the energy sector have shown that training leaders as inclusive mentors creates benefits which extend beyond individual development to encompass safer, more equitable worksites (E-Oz Energy Skills Australia, 2016).

Collectively, this evidence shows that mentoring achieves its greatest impact when situated within systems that actively address gendered barriers, promote accountability, and align individual support with organisational and cultural transformation, rather than relying on mentoring alone to fix inequality.

Evaluated approaches

Across the various models, mentoring programs consistently demonstrate positive effects for women working in male-dominated workplaces and industries, improving both individual and career outcomes. Confidence and resilience are among the most frequently reported benefits, enabling mentees to navigate workplace challenges more effectively (Carter, 2020; Dashper, 2019; Vassallo et al., 2021). Confidence is a central outcome, underpinning women's ability to assert themselves, seek opportunities, and manage challenging workplace dynamics (Ellis Jones, 2022; Jones et al., 2017; Vassallo et al., 2021). Beyond psychosocial gains, mentoring supports the development of professional and leadership competencies, including strategic thinking, decision-making, and business management, while also improving work–life balance (Carter, 2020; Dutta, 2020; Jones, 2017; Vassallo et al., 2021).

Mentoring relationships expand access to professional networks and career opportunities, connecting women with key contacts and collaborations that enhance visibility and belonging (Carter et al., 2020; Dashper, 2019; De Vries et al., 2006; Durbin et al., 2020; Jones, 2017; Leenders et al., 2020; Menches and Abraham, 2007). Collectively, these outcomes translate into tangible workplace advantages for women: higher promotion rates, improved retention, and increased access to leadership opportunities (Gardiner et al., 2007; Dutta, 2020; Vassallo et al., 2021).

Mentors themselves also report valuable learning outcomes from taking part in mentoring activities, including stronger coaching and communication skills, broader professional networks, and greater awareness of gendered workplace barriers – benefits that can reinforce inclusive leadership practices (Carter, 2020; De Vries et al., 2006; Vassallo et al., 2021). In reverse or mixed gender mentoring, senior male mentors often gain a deeper understanding of women's workplace experiences, which can shift attitudes and behaviours and create a ripple effect that supports lasting cultural change (De Vries et al., 2006; Vassallo et al., 2021).

Despite the positive demonstrated effects of mentoring on individual outcomes, structural inequalities, organisational politics, and entrenched cultural norms often remain unaddressed, indicating that mentoring is most effective when embedded within broader equity-focused initiatives (Dashper, 2019; Jones, 2017; Vassallo et al., 2021). The evidence

base is also limited: most programs target women as menteers, with limited evaluation of men's participation or the collective effects of mentoring across workplaces (Gardiner et al., 2007). Evaluation studies frequently rely on small samples, short-term follow-ups, and self-reported outcomes.

Summary and implications

Mentoring is critical in supporting women's participation and retention in male dominated trades, although specific evidence for the electrical sector remains limited. Women focused programs consistently build confidence, strengthen professional and technical skills, and improve perceptions of safety. While mentoring enhances women's experiences and progression, its lasting impact depends on alignment with broader organisational reforms and sustained cultural change. Approaches that include men, such as reverse mentoring and supervisor targeted programs, show promise for improving workplace culture, increasing male awareness of gendered experiences and fostering inclusive leadership practices, though these models remain under evaluated. Collective and wrap-around mentoring models facilitated by GTOs or unions are associated with the most durable workplace inclusion outcomes.

Despite these insights, key research gaps remain. There is little long-term evidence for mentoring in the electrical trades, limited assessment of men's engagement and behaviour change, and few comparative studies examining women only and integrated approaches.

5. Collaborative partnerships to influence workplace change

Industrial relations and skills organisations have increasingly emphasised tripartite and cooperative approaches to achieve mutual gains for workers, employers, unions, governments and other stakeholders (Bray et al., 2020). These approaches have been used to address complex workplace challenges including productivity improvement, labour supply and job quality, and are evident in the work of bodies such as the Fair Work Commission, the Fair Work Ombudsman, Jobs and Skills Australia and the Australian Treasury (Bray and MacNeil, 2020; Australian Government, 2023). Practitioners and scholars now widely recognise gender inequality in the labour market as a wicked problem that is systemic, multi layered and beyond the capacity of any single actor to resolve (WEET Taskforce, 2023; JSA, 2025; Hill et al., 2025). Addressing it requires coordinated effort across employers, unions, governments and related institutions (Fitzsimmons et al., 2025).

In response, governments are promoting coordinated approaches in which employers, trade unions and industry bodies work together to align policy settings and avoid fragmented strategies that fail to deliver structural change. Evidence suggests this is especially important in male dominated sectors, where whole of industry strategies are considered essential to tackling entrenched inequalities (Lingard and Turner, 2022). This logic underpins the Building Women's Careers Program, within which the Big Sister initiative sits. However, despite strong policy support for collaborative practice, there has been limited robust evaluation of what such approaches deliver in practice, how they operate on the ground and the conditions under which they generate meaningful impact.

Dynamics and drivers of the problem

Research highlights that improving gender equality in male dominated trades requires not only evaluating individual interventions but also understanding how these initiatives are integrated and supported through cross organisational and multi stakeholder partnerships. When efforts are fragmented, short term or driven by isolated actors, progress often

dissipates once project funding or leadership attention ends (Hajikazemi et al., 2025). The project based and transient nature of industries such as construction compounds this challenge. Temporary contracts, shifting teams and high mobility incentivise stakeholders to prioritise immediate project outcomes over sustained equity goals, resulting in inconsistent implementation and weak accountability over time (Hajikazemi et al., 2025).

Further barriers stem from projects operating across multiple sites with differing workplace cultures, which makes consistent regulation and enforcement of gender equality standards difficult. Complex supply and subcontracting chains can also dilute organisational responsibility for maintaining these standards (Wright and Conley, 2020).

These structural features intersect with deeply embedded masculine norms and informal cultures that endure despite formal equality commitments, leading to exclusionary behaviours, limited support for flexible work and tokenistic collaboration. Given that male dominated trades function as complex systems involving governments, unions, contractors, industry associations and workers at multiple levels (Lingard and Turner, 2022), lasting progress depends on coordinated, multi stakeholder approaches. Sustainable change requires partnerships built on trust, shared responsibility and transparent evaluation processes that extend across organisational and project boundaries.

Collaborative strategies and models to address the problem

Tripartite partnerships involving GTOs, employers and apprentices show the potential of coordinated approaches to increase women's access to structured training and safe placements (Bamberry et al., 2022; Berik et al., 2006). These partnerships formalise mentoring and strengthen accountability through structured reporting, employer oversight and clear pathways for apprentices to change placements when needed. Key enablers include shared governance, consistent resourcing and integrated evaluation frameworks.

A central limitation, however, is that GTO facilitated partnerships can reinforce power imbalances if employer interests dominate. Short term placements may also reduce continuity and limit long term outcomes (Bamberry et al., 2022). When well managed, these models can enhance women's retention, build skills and confidence and support safer working conditions.

Cross industry collaboration likewise holds promise. A notable example is the Construction Industry Culture Taskforce (CICT), which seeks to transform entrenched long hours norms in the Australian construction sector (Lingard and Turner, 2022). Bringing together competing contractors and public sector clients, the CICT developed a Culture Standard that caps weekly working hours and promotes flexibility and wellbeing. Stakeholder buy in, consistent piloting across multiple sites and clear evaluation processes enabled early progress, although sector wide adoption remains essential for systemic change.

Not all collaborative efforts translate into meaningful practice. Some employers, unions and training organisations demonstrate limited commitment to gender equality beyond surface level support, particularly in male dominated leadership contexts (Bamberry et al., 2022; Clarke et al., 2005; Pocock et al., 2011). Even so, early evidence shows positive effects including improved retention, increased female participation and higher employee satisfaction, illustrating the potential of coordinated, industry wide strategies to challenge exclusionary workplace practices.

Government-led public procurement can incentivise private sector adoption of gender equality standards, as exemplified by the Women into Construction (WiC) project in London (Wright and Conley, 2020). Multi-stakeholder collaboration involving government agencies, industry skills boards, and construction firms led to an increase in women's apprenticeship

participation and employment. This model demonstrates how procurement can leverage systemic levers to improve participation, retention, and equitable workplace culture.

Advocacy partnerships and women's peer networks such as SALT and Women in Power further contribute by providing peer support, mentorship and advocacy (Jones et al., 2017). Their activities span school outreach, policy advocacy, and direct workplace support, addressing structural and cultural barriers simultaneously. Enabling factors include sustained funding, strong institutional partnerships, and clear governance structures. Their impact is constrained without broader industry or government alignment, and limited longitudinal data makes measurement difficult. Nevertheless, these networks improve women's confidence, visibility, and retention and influence organisational norms.

Collectively, these strategies show that partnerships across GTOs, industry taskforces, public procurement initiatives, and advocacy networks can improve women's participation, retention, and workplace inclusion. Effective collaboration relies on shared governance, adequate resourcing, clear roles, and embedded evaluation, while limitations include short term funding, fragmented accountability, and variable commitment. The evidence supports the need for systemic and sustained collaboration to achieve meaningful and lasting gender equality outcomes in male dominated trades.

Evaluated approaches

A collaborative initiative that has been positively evaluated in academic research is the strategic use of Government-led public procurement. As discussed above, the UK's Women into Construction (WiC) project demonstrates how multi stakeholder collaboration across government agencies, industry skills boards and construction firms can deliver tangible outcomes (Wright and Conley, 2020). More than 250 women were employed on the Olympic Park project, and women's apprenticeship participation increased from 1 to 2 percent to 6 percent. Regulatory support, political commitment, and ongoing coordination were critical enablers. However, its close alignment with the London 2012 program meant outcomes were context specific and short term, underscoring the risk of progress ending when major projects conclude.

Another collaborative approach that has been identified as promising in the research is a multi-stakeholder program to change the culture of long working hours in the Australian construction industry (Lingard and Turner, 2022). As discussed above, the Construction Industry Culture Taskforce (CICT) brought together competing contractors and public sector clients with the aim of addressing work quality and retention, while also improving gender equality and inclusivity in the industry. A report published by RMIT University found the CICT initiative was highly successful, reporting that the Culture Standard did not negatively affect project timelines and costs, that workers responded positively to the Culture Standard, and they felt more productive, retention improved, and female participation rates increased (Lingard et al., 2025).

Summary and implications

Research indicates that multi-stakeholder collaboration can enhance the legitimacy, reach and capacity of gender equality initiatives in male-dominated trades. Collaborative approaches, such as union–employer partnerships, women's trade networks, and public procurement projects, have been linked to women's improved access to training, better retention, and improvements in workplace culture (Bamberry et al., 2022; Jones et al., 2017; Wright and Conley, 2020). Despite this promise, evidence on the direct impact of collaboration on gender equality outcomes remains limited. Few studies systematically

assess whether partnerships improve measurable indicators such as women's participation rates, career progression or workplace culture.

There is little long-term research, meaning the sustainability of partnerships in industries dominated by short-term contracts and subcontracting is unclear. The roles of trainers, GTOs and industry associations in coordinating and sustaining change are underexplored, meaning the mechanisms by which collaboration influences outcomes are poorly understood. This lack of robust evidence highlights the critical need for systematic evaluation to determine which collaborative approaches effectively improve gender equality, and which may inadvertently reinforce power imbalances or prioritise employer interests over employee wellbeing. Evaluating both outcomes and the process of collaboration is essential for understanding what works, under what conditions, and how these strategies can be sustained over time in male-dominated, project-based trades.

Conclusion

Women's underrepresentation in the electrical trades reflects long-standing structural, cultural, and institutional barriers that operate across the education, training, and employment pipeline. This rapid review shows that while numerous initiatives have been proposed to improve gender equality in the trades, including school-based outreach, inclusive VET practices, mentoring, and multi-stakeholder partnerships, few have been systematically evaluated. Much of the available research identifies promising strategies rather than tested interventions, meaning there is limited evidence on which approaches are most effective in improving women's participation, retention, and progression in electrical and related trades. This lack of robust evaluation constrains policy learning, limits transferability, and hinders the development of sustainable, evidence-based practice.

The Big Sister Program directly addresses this gap. It draws on existing research to inform its design while embedding a rigorous evaluation framework to generate new evidence on what works, for whom, and under what conditions. By uniting employers, unions, training providers, and industry associations, the program provides a coordinated, multi-level approach that integrates individual mentoring with structural and cultural change. Through its systematic monitoring and evaluation, Big Sister aims to not only support women's entry and advancement in the electrical trades but also contribute critical insights to strengthen future policy and practice across the wider skilled trades sector.

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