

 SEM AND COMMUNITY COLLEGES

Scaling Deep to Make Space for Females in Trades: Transformational Inclusion at a Community College

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The authors use the skilled trades shortage as a unique context to pilot transformative approaches to changing culture and practice around equity, diversity, and inclusion (EDI) in recruitment, progression, and retention of previously-excluded student groups, focusing on gender. To demonstrate how this approach can help achieve the necessary rapid increase in skilled tradespeople to address the labor shortage and its societal impacts, this article reviews the gender gap in Canada and the United States, incorporating recent research on diversity within the trades experience for female and gender-diverse participants. A framework for equity-oriented SEM is outlined, recommending strategies for cultivating a SEM culture within a trades department, and exploring strategies for increasing female and gender-diverse participation through partnerships for early awareness and pre-trades programming, with consideration for equity admissions in apprenticeship training, where that opportunity exists.

Okanagan College (OC) is a mid-sized community college with a long history of trades training in British Columbia (BC), Canada, now at the outset SEM and EDI strategic work. OC and its work in trades-related SEM provides the site for tracing emergent practices and early successes and for considering risks and challenges in equity-oriented SEM (Kalsbeek 2023). Based on the reflective analysis of activities and their outcomes,

the trades department at OC has worked to move away from EDI initiatives that create an overlay of expectations onto an existing system (Marom 2023), and toward transformative inclusion as a form of action-based culture change that broadens and deepens perspectives, practices, and relationships at department, institution, and community levels.

OC's recent commitment to transformative inclusion is grounded in the understanding that substantive inclusion will transform recruitment, retention, instruction, and thus the institution and its role in the communities it serves. Transformative learning theory posits that active learning experiences challenge and reassess our "taken-for-granted frames of reference" to foster more inclusive and reflective beliefs and actions (Mezirow 2000, 8). This approach requires institutions deepen their SEM strategies to foster sustainable change by involving all stakeholders; for instance, creating opportunities for instructors and potential students to collaboratively experience diversity can help build an institutional culture grounded in respect and reciprocity (Marom 2023). The authors suggest this will require intentional and explicit personal, departmental, and institutional curiosity and the willingness to learn and change long-standing assumptions.

The authors acknowledge the limits of their lived experience as being white, cisgender, and heterosexual, while attempting to maximize the experience brought to this challenge through a variety of training, education, and employment paths and from their distinct positions within a college, including as a male instructor and department head. The authors' current responsibilities range across instruction, enrollment management, program and partnership development, program and departmental administration, and departmental and EDI strategic planning. Their collective expertise and collaborative work support innovative, theoretically-informed, and industry-responsive approaches to inclusive trades training with potential broad application for other areas of postsecondary education through strategies to confront dominant gender roles or other cultural biases.

Colleges and Gender Inclusion

Community and technical colleges are ideally positioned to advance transformative inclusion, given their central position in the trades training system and their capacity to leverage community partnerships to envisage and implement equity-oriented SEM activities, including a focus on gender (Kalsbeek 2023; Struthers and Strachan 2019; Stroh 2015). With the support of

high-level leadership, and awareness of the need to navigate potential legislative constraints, a systemic approach to address the skilled trades shortage by transforming community and family perceptions to view trades careers as excellent opportunities for women is discussed here. This approach, which aligns with the "scaling deep" strategy by the Canadian Coalition of Women in Engineering, Science, Trades, and Technology (CCWESTT), does not rely on equity admissions but can be supported by it.

Scaling deep requires creating cultural shifts and affecting cultural ideals. Scaling deep comes with the recognition that cultural beliefs and societal norms play a crucial and central role in perpetuating or dismantling problems. As such, for systemic change to occur, change must first take place within people, relationships, communities, and cultures (CCWESTT 2023).

Currently, a significant barrier to female enrollment in trades is the pervasive belief that trades are unsuitable for women, with those who participate expected to exhibit "masculine" traits or be resilient in a traditionally masculine environment (SRDC 2023; Braundy 2018; Skulmoski 2015). This frame of 'masculine' traits excluding women from trades creates a further barrier by reinforcing stereotypes of gender as fixed and binary, which supports cultural narratives of gender-based differences and is used, in turn, to argue for "appropriate" roles for men and women. To counter the first barrier, the authors posit that colleges and their partners need to actively reshape the story of who belongs in the skilled trades. This can be partly achieved by promoting diverse female role models, emphasizing safety, professionalism, good salaries, and rewarding careers to the community. It benefits from reframing trades careers as fulfilling roles that align with traditional cultural values and expectations for women's roles in community; for example, focusing on building homes, hospitals, and schools.

However, the approach of scaling deep—which focuses on the interplay of systems and cultures—also highlights the need to address the second barrier to full inclusion that is created when gender is presented as fixed and binary. Gender is now more commonly

understood as a spectrum of identities and expressions experienced by some people as fluid and non-binary. Much of the extant literature uses the language of “women in trades;” most statistics reinforce binary genders of male/female; and in terms of population and student numbers, participants are more likely to identify as cisgendered than gender-diverse (non-binary, fluid, trans, etc.). The discussion that follows, therefore, uses a binary frame for gender when specific to the context; while that does not speak to the specific experiences of people who identify as gender-diverse, it provides valuable insights into how social realities shape or constrain opportunities for diverse gender inclusion in trades. Where gender-diverse experiences have been documented, they are included here.

Taking a fluid and non-binary understanding of gender is a crucial component of transforming the cultural biases and norms that perpetuate existing barriers to equitable and inclusive access to and success within trades. The approach articulated here affirms a gender-inclusive commitment, such as working with instructors to recognize and highlight what female and gender-diverse persons bring to their industry. This approach requires engaging female and gender-diverse students themselves in reshaping their own story, as suggested by Struthers and Strachan (2019), to include their understanding of their strengths, values, and career expectations going forward.

The authors posit colleges can greatly expand the recruitment of females and gender-diverse persons in trades by focusing on two core avenues of innovation, through SEM and EDI leadership, and leveraging ongoing, sustainable relationships with industry, unions, secondary schools, and families. The first includes strategies known to be successful for other “marginalized and minimized students” (Connell and Smith 2023), such as targeted recruitment and diversity admissions policies (Tamtik and Guenter 2019); in this case, gender-based priority seats and career awareness campaigns. The second focus is elementary to high school level opportunities for engaging, hands-on access to trades skills. Here, repeated positive and rewarding experiences are offered for female and gender-diverse stu-

dents in grades four through twelve so they feel they belong in trades from an early age, followed by accessible and inclusive progressive training opportunities transitioning from high school to college. Industry and instructor involvement is prioritized throughout to encourage their transformative learning and, wherever possible, the support networks are invited into this exploratory and training space.

The learnings from and benefits of this two-fold approach are relevant beyond the specific context of increasing recruitment of female and gender-diverse persons into skilled trades training. Successful techniques in supporting their interest, access to and success in trades offer insight into ways to broaden participation and success rates for all potential learners, by strengthening confidence in their skills and normalizing collaboration with a diverse group of tradespeople. This can encourage students from the full range of family origins and structures into careers in skilled trades, and both encourage and energize instructors. These strategies offer insights into parallel challenges where training to address a critical sector need might require rapid culture change and transformative inclusion around gender norms, such as increasing the participation of males in nursing (Egan 2024; Twomey and Meadus 2016).

The Gender Gap

Underrepresented trades include construction, motive power, and manufacturing and are defined as having lower than 25 percent participation by females. Females are significantly underrepresented in most trades, now making up 7 percent of apprentices in Canada and less than 5 percent in the United States, outside of traditionally-female or mixed trades such as hairdressing and professional cooking (Statistics Canada 2025, Urban Institute 2023). Progress has recently moved more quickly after many years with little change, but numbers remain low. For example, in 2023, despite doubling their participation since 2018, females still made up less than 3 percent each of carpenters, electricians, and plumbers in the United States (IWPR 2024), and high schools have not attracted “anywhere near enough” students into

trades careers to meet industry demand, particularly for construction trades, and the participation of females has been especially low (Soricone 2020, 19).

This indicates the level of opportunity existing for colleges and universities that offer trades training, if they can commit to scaling deep to address why that gap exists and what is needed to transform barriers of both perception and opportunity. The authors suggest this will require consideration of both culture and systems. If these institutions can effectively address the barriers that limit female and gender-diverse participation, they could significantly boost their enrollment and also help alleviate critical labor shortages that are hindering economic growth, delaying infrastructure projects, and exacerbating the housing crisis in both Canada and the United States (BCCWITT 2025; CCWESTT 2023; Peachman 2024; Homebuilders Institute 2023; IWPR 2021; Powell and Richardson 2021; Statistics Canada 2024).

If women are “the largest untapped source of skilled trades workers” (BCCWITT 2025), significant focus should be put toward encouraging their participation. If involving them in trades is one of the main ways to increase not only productivity and economic growth overall, along with providing opportunities for higher paying jobs and individual economic independence (Frank and Frenette 2019; IWPR 2021; CCWESTT 2023), closing the gender gap by creating space for inclusive gender participation in trades should be a priority for institutions, policymakers, and society overall. Organizations such as the Canadian Apprenticeship Forum (CAF) have identified this need (2020), while focusing on gender bias in hiring and retention strategies for employers. SEM and systems thinking provide a perspective to look at what is behind the gap to make change through much earlier intervention in the system.

Systems Thinking and Gender Bias

Systems thinking provides a framework to look widely and deeply at what forces might be at play in the current “social reality” (Goodchild 2021, 79), including consideration for any balancing forces that persist in limiting social change (Stroh 2015, 50). As discussed in Dever (2021), the longstanding “otherness” of females

in trades and the gender bias it creates are the balancing forces limiting their participation and success. According to Dever (2021) and Gyarmati, Pakula, Nyugen and Leonard (2017, 31), the preconceptions of female roles, interests, and abilities are what lies underneath the “system under-promotion and under-exposure of trades,” leading to the discrimination that is a symptom of the problem, rather than the problem itself.

Girls and young women receive less positive exposure to the trades in schools and at home (Bridges, *et al.* 2022; Gyarmati, *et al.* 2017). This reduces their opportunities to try trades, limits confidence in their capabilities, and may lead to active avoidance of trades as unsafe for them (SRDC 2023). Meanwhile, their teachers, counselors and families continue to promote “female” occupations and focus on university pathways (YWCA 2022; Jones, Clayton and Pfitzner 2017; Rousseau 2019; Rupnarain 2024; Weikle 2019), and often, share the message that trades are not for girls. The message that women might not belong is further reinforced by the fact that few high school shop teachers or postsecondary trades instructors are female and at least until recently, there have been few female role models (Braundy 2018; Masden 2019; Soricone 2020).

Rather than considering the “social reality,” until recently, many stakeholders assumed that if females were interested in trades, they would participate, although it would be difficult and they might need extra support—in effect, “shifting the burden” in the system (Stroh 2015, 57) onto the individual and focusing on strategies that would support them once they made that choice. For example, programs like the BC model for Women in Trades Training (WITT) and the Women in Apprenticeships and Nontraditional Occupation (WANTO) grant structure in the United States have supported increases to female access and success in trades for adult women, often with a focus on women with multiple under-represented identities. However, they bring women into trades a few cohorts at a time, without changing the system they are entering. By having special classes, support, and mentorship programs, they reinforce the perspective that it is not “normal” for women to be tradespeople. They have generally been dependent on

project-based funding and have not led to institutionalized support throughout the sector (SRDC 2022). Like the point made by Ness, “most jobs in the construction industry can be done by women” as appearing on the surface to “challenge the dominant ideology” while reproducing it (2012, 1), as does the concept of a separate program for “Women in Trades.”

Research has shown that the issue is not that females (or gender-diverse persons) are not as interested in trades or less able (Braundy 2018; Dever 2021; SRDC 2023); it is that societal attitudes around gender roles and expectations about who should be working in trades continuously discourage females to be viewed by anyone, including themselves, as being able to participate as tradespeople on their terms in an environment that welcomes them. Further challenges exist to attract females into trades who are not white, cisgender, or heterosexual, given they may experience compounded barriers due to “belonging to multiple marginalized groups simultaneously” (Cech and Waidzunus 2021, 6; SRDC 2023). They may also experience greater rates of discrimination and harassment (Curtis, Meischke, Simcox, Laslett, Monsey, Baker and Seixas 2021; Dever 2021; IWPR 2024; Tapper and Baker 2024). SRDC (2023), for example, discussed 2SLGBTQ+ experience with trades in Canada in detail, where 2SLGBTQ+ persons do not see themselves in trades due to an expectation of being unsafe in a toxic masculine environment and where trades are generally not marketed to them, reinforcing their exclusion. Similarly, CAF (2019) found multiple additional barriers for Indigenous youth to access trades training opportunities, due in part to unwelcoming institutions and workplaces.

The resistance to females in trades appears rooted in concerns about physical and emotional safety and their expected role as caregivers. Females often face resistance in male-dominated training and work environments where their exclusion has been culturally acceptable. The stigma of trades as low-status, low-skilled labor in a harsh environment persists, discouraging many communities from promoting trades careers for girls (Bridges, *et al.* 2022; Rupnarain 2024) and justifying inaction. These perceptions are deeply ingrained; for

example, some instructors grow facial hair to appear more “trades tough” and females in trades may adjust their language, their conversations, and their appearance to better fit in “as one of the boys” (Dever 2021; Tapper and Baker 2024), even when the expectations of the boys themselves have changed (Peach 2022). There’s also a pervasive belief that women, as primary caregivers, won’t succeed in trades due to the long hours or inflexible schedules, or where they might leave to work outside of their communities and away from their support networks (Peach 2022), despite the acceptance of other professions with this type of work environment, or in environments where they are frequently exposed to physical risk and harassment, despite this being common in careers accepted as “female,” such as nursing, (BC Nurses Union 2025a, 2025b).

Colleges could be making a much bigger impact on cultural norms than they have done, and now is the time to make a change, given the current window of opportunity due to the labor shortage and the opportunity to position inclusion in trades differently, such as females supporting their communities through becoming tradespersons. Colleges have the benefit of being directly connected to community labor needs, usually working with local school boards, industry representatives on advisory committees, and organizations at the local and state or provincial level involved in curriculum goals and delivery models. Goodchild (2021) supports this, going beyond Stroh’s considerations for how to achieve lasting social change through a better understanding of the root causes of a problem and more effective leverage of relationships (2015), arguing that to change a system, we must begin with the interconnectedness of its relationships, and to understand them, understand the culture beneath.

The authors agree with the research above that the highest potential for transformation lies in addressing gender bias. If Canada is to reach the CAF goal of 15 percent female participation in skilled trades by 2030, or the United States is to achieve its housing and infrastructure goals, and if we are to move beyond pushing more women into an unwelcoming system, significant progress in policy actions will first require a para-

digm-challenging approach to ideas (Nutley, Walters, and Davies 2009). Effective, transformative interventions into this unwelcoming system require a change in the “dominant script” around gender, following de Beauvoir in Dever (2021). Where the authors believe their learnings can make a unique contribution is the emphasis on including youth and families as a significant part of the training system. Change should start with early interventions that normalize girls and gender-diverse persons in trades and build a sense of belonging from the outset. By taking this wrap-around, community-based, long-term perspective, conditions for lasting and sustainable change are created. Following systems thinking, this goal of transformative inclusion requires all partners to create new perspectives for everyone in the system far before females and gender-diverse individuals are ready to enroll in traditional trades training programs.

Leadership, SEM Culture and Trades

Equity-based SEM requires openness to equity discussions beyond inclusion (Tamtik and Guenter 2019) and a willingness to “appreciate the time required to effect change” (Stroh 2015, 51). Recent EDI efforts have sometimes led to pushback, as they were imposed on institutions without time for integration into people’s experiences, making them seem politically motivated rather than presented as opportunities for engagement. Marom discusses these concepts in the specific context of developing an EDI culture in postsecondary institutions, proposing a focus on the relational rather than the ideological to open dialogue (1102) and the need to intentionally interact in relationships that will create opportunities for “real structural change” (2023, 1103).

To create space and energy for this change, leadership must prioritize equity in strategic planning. For example, Okanagan College’s 2022 *Inspire* Plan includes a priority goal to increase participation and success for marginalized groups by 2026–27. With this type of commitment, departments can put efforts into analyzing enrollment data and student experiences to identify areas for improvement and action. Following Struthers

and Strachan (2019) and Kisilevich (2022), the authors suggest postsecondary leadership influence to support significant change in female and gender-diverse enrollment. This can be done through promoting trades as a pathway to success equal to academic programs, engaging with stakeholders across the system, formally aligning their goals with the recommendations of organizations such as IWPR, CAF and CCWESTT, fostering dialogue, and sharing equity data. They can also support their departments to create inclusive experiences, leveraging combined influence to boost female and gender-diverse enrollment and, therefore, the overall number of skilled tradespersons.

The current trades training system supports a basic SEM culture. Trades training is linked directly to industry with apprentices working for most of the year and returning periodically for technical training. Trades departments are connected in ongoing relationships with industry, both directly and through government funders who are heavily guided by employers. A college must collect information on the number of apprentices already in the system and those needed for future work as well as continuously adapt their enrollment to fill industry needs in the various trades as the activity in each ebb and flow, and system-wide utilization targets may already exist. Provincial, state or national apprentice data is typically available, often including gender and race information, although access to this data may be more challenging with recent political changes. Department chairs and enrollment managers involved with intake planning must consider delivery models to support industry workforce needs, student-centered timetables to support working apprentices and considerations for on-campus housing to accommodate out-of-region apprentices when not all programs are offered at all institutions due to the expense of machinery and equipment. What has not been a common feature of this strategic work, however, is factoring in race, ethnicity or gender, with a system firmly rooted in a tradition of white, male apprentices working for white, male employers, who have all been taught and trained by white males.

Industry in recent years has focused on creating welcoming workplaces and recruiting diverse appren-

tices, especially females, due to the skills shortage and the need for increased innovation, teamwork, and professionalism, with examples from the Automobile Retailer's Association (2021) to the Canadian Electricity Association (2021) to Canadian Manufacturers & Exporters (2022). Some companies are taking a transformational approach themselves by integrating inclusivity into every level of their work (PCL Construction 2024a) and "actively empowering women to lead, innovate and inspire" (PCL Construction 2024b). Labor unions also support this effort through initiatives like the North America's Building Trades Unions *Tradeswomen Build Nations* and *Lean in Circles* (2024), "Sisters in the Brotherhood" programs that offer support and leadership training, or other resources and success stories such as those highlighted by the Christian Labour Association of Canada (2024).

To drive change, it is necessary to demonstrate the "creative tension" between how far the current state is from what could be (Senge, in Stroh 2015, 73). The existing industry focus on EDI may not be evident to trades departments or communities without active effort on the part of the college and its partners to raise that awareness. Only then can there be pressure to prepare a broader group of students to meet that need. Colleges must prepare for resistance to change and focus on change leadership by expanding SEM culture, fostering shared accountability, developing faculty-driven goals at the department level, and building momentum through shared successes (Furbeck 2021; Matthews 2020; Romano and Connell 2015; Smith and Harris 2021; Stanton, Black, Dhaliwal and Hutchinson 2017).

Beyond data-driven action, low participation becomes unacceptable when it is clear from shared experiences and ongoing relationships that people who are eager to learn and contribute to their industry are systematically discouraged, and further, that females love their work in trades for the self-reliance and ability it brings to tangibly help others (Gyarmati, *et al.* 2017, 31; Masden 2019, 28, 50). Rather than focusing on the limits to female participation and success, space should be made to focus on what they can bring to the system. Recruitment and inclusion of gender-diverse individu-

als has the potential to make space not only for a wider vision of gender roles, but a wider vision of gender itself, which further breaks down barriers.

The department can influence change by identifying gaps in female participation with the greatest potential for impact, such as the critical role instructors play in retention (Colleges and Institutes Canada [CiCan] 2021; Gyarmati, *et al.* 2017; Masden 2019; University of the Fraser Valley 2009). When departments see female and gender-diverse participation gaps as a problem they can solve, colleges can use SEM to drive lasting social change (Stroh 2015), positioning faculty as change-makers. With a willingness to be accountable to change the system, equity-oriented SEM (Kalsbeek 2023) can be extended to gender, rapidly increasing female and gender-diverse participation through high-impact targeted recruitment strategies that include instructors, such as early awareness outreach and pre-trades programming.

Gender Based SEM Strategies

As per Kalsbeek (2023), equity-oriented strategic enrollment management must operate within the legal parameters available, and what is politically acceptable will also change over time by region and institution. In consideration of equity, some Canadian institutions have adopted targeted diversity recruitment strategies in recent years, while a few have adopted diversity admissions processes (Tamtik and Guenter 2019). Diversity admissions strategies in Canada are most common for Indigenous applicants for programs in law, healthcare, or education. In addition, there are a few examples of more general equity admissions pathways, some of which include gender as a potential source of disadvantage, such as the University of Calgary and Ontario Tech University. Many universities and colleges have utilized special cohort programs for females in exploratory Science, Engineering, Trades, and Technology (SETT) programs in Canada and the United States, but only a few colleges and technical schools have gendered admissions for females in multiple SETT programs, such as Algonquin College in Ontario and OC in British Columbia.

Where a college can utilize equity-based admissions, they can support faster access to women who are al-

ready interested in trades, enrolled in exploratory programs, or working in trades through a priority seats model. Such models can reduce barriers to participation that are due to the timing of their application or the overall demand for seats, and tracking applications by gender (in addition to enrollments) can demonstrate the interest level that is already there, as well as demonstrating commitment to equity. The more rapidly the critical mass is reached, the sooner participation is normalized and female enrollments become a stable part of the enrollment mix.

In the view of the authors, an inclusive, long-term recruitment perspective will have a greater impact over time and can be used with or without the option of equity admissions. This perspective starts with EDI as described in Connell and Smith (2023, 4), focusing on inclusion by removing systemic barriers and equity through equity-based recruitment strategies to create a critical mass of students and “challenge and dismantle stereotypes over time,” including through sharing success stories with the community (11–13). For example, if a lack of role models for females is the largest issue on the surface, and if support in this area mitigates the deeper issue of sexism (Gyarmati, *et al.* 2017; Masden 2019), departments will need to provide this support before enrollment. As per Gottheil (2015), it is necessary to reach out to prospective students to determine how to assist them to “fulfill their aspirations;” we cannot assume they will just come to us (15). If the system under-supports females right from grade school, this is where a college can provide a critical mitigative step through its relationships with its partners, including extending these considerations and supports to gender-diverse youth, identifying relevant role models and understanding distinct experiences and barriers sufficiently to provide meaningful support.

To follow this outreach further, the authors suggest including families in recruitment efforts to broaden the enrollment funnel as well as deepen it. There are many strategies common to encouraging underrepresented students and families to make connections to colleges and to allow for orientation to the campus and college processes, including during high school (Tugend

2021), but intervening much earlier and more often is required to prepare students and change society’s perspective on an entire group of careers and gender roles within them. Further, assumptions should not be made around what parents know about trades, as per Rupnarain (2024) and Gyarmati, *et al.* (2017), and consideration should be given to what values and elements of support are involved in families where girls are encouraged to go into trades. If it is having family members who are in trades themselves, invite trades families onto campus to share their experiences with other families; if it is having exposure to making shop projects together, create opportunities for that experience. These experiences foster relationships and provide an opportunity for discussion to help dispel some of the misinformation about trades to more than one generation. Families can provide support for success, especially to underrepresented students, and they are a significant source of socialization; therefore, we will need to engage them in any change we wish to make (Rupnarain 2024).

With the above in mind, along with strong support from leadership for EDI action, OC Trades has focused on youth since 2020 through school district partnerships to increase female participation in trades. This focus is already showing results, with significant increases in the participation of females at the exploratory and foundational level, and early indications of an increase coming for the apprenticeship level. In the past year, this focus on youth has expanded to include families and industry mentors. This work is now further supported through equity admissions, a SEM Plan framework and expanded capacity for data analytics and research, SEM and EDI leadership and a focus on changing culture through shared experience, or transformative inclusion.

The Okanagan College Example

The benefits of a collaborative, systems approach utilizing partner relationships can be seen in the recent rapid increase in female enrollment in trades programming at OC. By using an EDI lens, OC has started to change the narrative around women in trades at the community level, introducing new perspectives and opportunities

for transformative inclusion, creating space to be more intentional around the inclusion of the full spectrum of gender diversity as time and efforts progress. Government and industry partner funding has further supported new pre-trades programming to drive long-term recruitment strategies.

The OC Trades Department (OC Trades) strategy toward equity-oriented SEM began with self-reflection, as per Kalsbeek (2023). A 2019 departmental study reviewed female enrollment progress made since 2010 and began tracking female applications and enrollment as part of weekly reports. This revealed a significant gender gap, particularly for youth, with only 9 percent of dual-credit high school students being female, compared to 15 percent female participation in foundational programs overall. It also found variations in female participation in trades at the foundation level, following a similar pattern to the national statistics noted in Frank and Frenette (2019). Collision repair and recreational vehicle were at the top at 30–32 percent, followed by cabinet-making, aircraft maintenance—structures and welding at 20–25 percent, with most motive power and construction trades in the middle at 12–15 percent, and mechanical building trades at the bottom at 9 percent. There was a steep drop at the apprenticeship level for all trades, with a total participation rate of 5–6 percent, and again, with significant variation between trades from 1–14 percent and following a similar pattern to foundation in terms of trades with higher levels of participation.

This provided a baseline for participation and indicated that although interest was approaching “critical mass” in a few trades, it had not yet continued into career participation, and in most cases was not at all there yet, following a similar pattern to that of the rest of the province (Industry Training Authority 2022). Interestingly, aircraft maintenance structures included some of the strongest career participation from females, and this program has been offered as a certificate since 2012 in BC, rather than a traditional apprenticeship; the impact of parity of esteem efforts toward trades certificates and diplomas on female enrollment will provide an area for further research.

Additional research focused on the participation of young females demonstrated that some of the barriers included lack of confidence in their abilities, anxiety, and fear around not knowing as much as males in the class, a hesitation to be seen as less feminine and to engage in the competitive nature of male-dominated training and careers (Struthers and Strachan 2019; YMCA 2022). Such concerns suggest the impact of a binary gender perspective that dictates distinct and “appropriate” gender roles, versus a spectrum that is inclusive of diverse identities and expressions, including expression and development of self through training and work pathways. The highest factor that increased participation, aside from having family members involved in trades, was participation in high-school programs (Gyarmati, *et al.* 2017), demonstrating the importance of supporting this pathway.

OC Trades shared this data, along with the low rates of participation found in Trades Samplers, with secondary school partners to raise awareness and initiate discussion. The gap was recognized as a problem that should and could be solved by collaboration between the partners, given their role in reproducing it, following Stroh (2015). OC and their partners responded by organizing female-focused samplers for youth and reaching out to potential female students to participate in dual-credit opportunities. With a demonstrated 38–50 percent progression from Trades Sampler to Foundation or Apprenticeship programs over four years, encouraging female participation in Trades Samplers was the first key recruitment strategy put into action.

OC Trades then shared the data on participation rates and the experiences of girls and women and highlighted national and provincial targets and best practices with college leadership, department chairs, and industry partners. This topic was brought forward in all enrollment and programming discussions and included in all reporting. Efforts made by OC, secondary schools, and industry organizations were highlighted for each party to encourage a feeling of shared accountability and to lay the groundwork for additional action.

In 2022, OC Trades proposed expanding priority seats beyond qualified Indigenous applicants to include

TABLE 1 ► Trades Samplers and Female Participation 2018–19 to 2023–24^a

	2018–19	2019–20	2020–21	2021–22 ^b	2022–23 ^c	2023–24
Intakes (n)	4	3	3	7	8	8
Students (n)	82	56	63	64	103	113
Female (n)	17	8	15	15	36	22
Female (%)	21	14	24	23	35	22
Female, BC (%)	10	16	9	18	21	19

Source: SkilledTradesBC^a Academic year running July 1 to June 30^b Includes 1 all-female intake^c Includes 2 all-female intakes**Notes**

■ In response to demand from school districts, OC plans to deliver eleven trades sampler intakes in 2024–25, including one all-female intake, with an anticipated total enrollment of 165, with up to thirteen planned for 2025–26, including one for adult females.

qualified female applicants in both foundation and apprenticeship programs, along with an equity priority seat in foundation programs to include gender-diverse applicants. This was the first time this was done in Canada, to the authors' knowledge, with the only comparable model being the Algonquin College *We Saved You a Seat* program for female powerline technician apprentices (Algonquin College 2024). This initiative required substantial research, goal setting, and leadership from OC's Equity, Diversity, Inclusion and Social Jus-

thought-out, with input from trades department chairs, school district partners, admissions and registration staff, and leadership, shared with industry representatives, and piloted in 2023 for 2024 enrollments.

To provide context for the overall importance of trades at OC, 2123 trades students were enrolled in 2023–24, which was 18 percent of the total students in credit programs. Enrollments in 2023–24 were divided into 5 percent trades sampler, 20 percent foundation and 72 percent apprenticeship programs, with 3per-

cent in diploma programs, demonstrating the importance of exploratory and foundational programming. Enrollment trends demonstrating the early impacts of strategies to increase female participation are outlined below, with “female” participation rates calculated from total counts of students with declared gender in OC sources.

The necessary critical mass for sustainable participation at OC appears to have been achieved at the exploratory level, and for some trades, at the Foundation level (with Welder and Electrician starting to fall into this category along with Collision Repair and RV Technician). This will help push up apprentice numbers in these trades and further focus on culture change

tice (EDISJ) Committee to prepare for potential internal and external resistance. Implementation was carefully

through early intervention is anticipated to bring up further enrollment, progression, and retention.

TABLE 2 ► Trades Foundation and Underrepresented Female Participation Before and After Priority Seats, by Academic Term

Term	Enrollment	Female ¹		Priority Seats
		n	%	
Winter 2023	182	35	19	no
Fall 2023	257	38	16	no
Winter 2024	214	35	20	yes

Source: Okanagan College¹ Includes only those who declared gender**Notes**

■ Female enrollment in underrepresented trades foundation programs increased from 15 percent in academic year 2018–19 (Sept 1–Aug 30) to 19 percent in 2022–23, and to 20 percent in Winter 2024. This compares to 11–15 percent in BC during the same period (SkilledTradesBC 2024).

■ Six trades foundation classes out of 28 (21%) in 2024 had higher than baseline female enrollments at OC, including three in Winter term - automotive service technician (27 percent), electrician (25 percent) and plumber (30 percent), and three in Fall term—electrician (31 percent), heavy mechanical trades (18 percent) and refrigeration and air-conditioning mechanic (12 percent).

■ As of October 2024, female participation in Fall 2024 is at 16 percent and the number of female applicants for Winter 2025 trades foundation classes has increased to 65 (compared with 45–50 for the past two years).

TABLE 3 ► Apprenticeship and Female Underrepresented Trades Participation 2018–19 to 2023–24^a

	2018–19	2019–20	2020–21	2021–22 ^b	2022–23 ^b	2023–24
Students (n)	1,798	1,518	1,348	1,318	1,394	1,407
Female (n)	126	89	96	75	92	99
Female (%) ^c	7.0	5.9	6.8	5.9	7.1	7.2
Female, BC (%) ^d	5.0	6.0	5.4	5.7	6.2	tbd

Source: SkilledTradesBC and Okanagan College

^a Academic year running September 1 to August 30

^b Reduced enrollment capacity due to COVID safety measures

^c Students with undeclared gender excluded from female participation rate for OC

^d Share of females in all underrepresented trades

Notes

- Non-binary and transgender data has been collected since 2022 but this data is not included here.
- Female apprentice rates increased to over 8 percent for both Winter and Summer 2024 following implementation of the priority seats policy in 2024. Statistics collected for the 2024 calendar year note enrolment of 105 female apprentices, with 60 percent of priority seats for female apprentices utilized (and unused priority seats made available to all applicants). This increase, along with all female enrollments, contributed to a 92 percent overall utilization rate for trades programs in 2024–25, with the higher demand at all levels allowing for additional intakes to be offered, increasing seat availability to all applicants, and contributing to an 8 percent increase in government funding approved for 2025–26.

Early Outreach and Career Awareness

Increasingly, OC department chairs and instructors attend information and recruitment events, such as high school and OC information sessions, providing the kind of direct access to support engagement discussed in Furbeck (2021), and working with local industry wherever possible. They also enthusiastically participate in new events such as *Try a Trade* events co-hosted by OC, local industry, and school districts, including industry mentors, youth and families in hands-on shop experiences. Importantly, this type of event allows parents to hear directly from instructors, staff, and leadership at the institution about trades training program expectations and directly from industry about local career opportunities in time to make decisions about high school courses.

Collaboration with local middle and high schools to support awareness of these events and provide a bridge between learning institutions has been a critical support, along with developing relationships with local industry. Adding female-only activities such as *Jill of All Trades™* days for grades nine through twelve has further connected girls, with instructors and with industry mentors, alumni and current apprentices in a high-energy, positive atmosphere. The *Jill of All Trades™* model was developed at Conestoga College in Ontario, and the inaugural OC event in May of 2024 witnessed a diverse group of 75 female high school students engaged and succeeding in transforming building materials into useable, enjoy-

able, life-size structures and creating small take-home projects utilizing trades skills. The instructors involved found the collaboration, mentorship, and sense of accomplishment both encouraging and contagious. By six months after the event, nine of the participants from the grade eleven and twelve groups had enrolled in trades training at the college. A second event was held in November of 2024, including another 66 participants. Twenty-two of the 2024 participants have now enrolled in trades training.

Pre-Trades and Exploratory Programs

Beyond early awareness and hands-on opportunities, trades programming at OC now begins with female and mixed-gender trades day camps for children as young as grade four with engaging activities such as “molding with metal,” “concrete creations,” and building and racing go-karts. Parents and caregivers can see their capable children using tools, building projects, and interacting with friendly instructors in safe, clean, professional environments. Participants can expect to share their experience with a range of genders, building respect and teamwork. Instructors who are interested in these opportunities and prepared for appropriate pedagogical approaches can spend time with a diverse group of students in a high-energy, high-reward environment. Industry partners can sponsor the camps, building relationships with institutions, creating positive connec-

tions, community recognition, and contributing to their potential talent pool, albeit well into the future.

The next step in this long-term recruitment and culture change process engages middle and high school students to try out more complex skills in environments such as welding camps through the CWB Welding Foundation, or “longboard design” camps, along with engaging evening or weekend shop activities such as *Auto Masters: New Drivers*, where they can build their confidence and skills and connect with instructors. The instructors at the camps may be from OC or local high schools or middle schools, providing further bridging and deepening connections between institutions.

With this level of comfort with the institution and connection between the schools and the college, the stage is set for a much broader group of caregivers to be willing to have their children participate in trades electives at the high school level, which can be traditional shop classes or exploratory programs utilizing college instructors, tools, and equipment, whether hosted at the secondary school or the college. Trades sampler exploratory programs, currently supported with provincial government funding, may be scheduled to fit within the interest, available space, and instructional capacity. Industry is involved in these programs through mentorship activities, “trades talks,” bursaries/scholarships, site visits and field trips and employment recruitment events. Again, a mix of all-gender and female-focused programs has made space for broader interest and a more inclusive learning environment and normalized female participation and success in trades activities while allowing for evolving comfort and confidence levels in the participants themselves.

The programs above normalize a wider range of students (and industry partners) for the instructor in a lower-stakes environment. They can support what can be a new perspective that although their job is to teach skills and ensure safety to prepare students for industry, it can also be to share their joy and passion in their trade and all trades (whether through sheet metal elephants or welded ants and spiders, being able to construct a mock house bathroom to get the lights to work and the toilet to flush, or the independence of

changing a tire or building a shelf) and to mentor someone vulnerable. Instructors have reported their energy increases through the energy of the young participants, and they return to their adult students revitalized and more positively engaged. These experiences can then lay the groundwork for a more inclusive learning environment where the traditional expectation of being stoic themselves and responsible for “weeding out” students not “tough enough” for industry can make way for one that is current and future-facing. Instructors can focus on building skills and encouraging confidence to prepare all students for an increasingly diverse and professional industry with a need for innovative design and technology and strategic and communication skills as well as physical and technical ones.

Foundational Programs

Offering dual-credit for trades foundation programs, which include level one apprentice technical training but are designed for students with little work experience and without a sponsoring employer, has further encouraged participation with minimal economic barrier, given school district tuition sponsorship, and again, allows for a lower-stakes participation whereby confidence can be built, for both the student and their family. Participating in such programs allows the student and caregiver to become aware of the training system, available financial and mentor supports, and again, to connect directly with industry through guest speakers, field trips and other community events, or within industry work placements. Bringing diverse role models and instructors into the classroom has also supported the participation and success of diverse students as well as sharing new business norms for accommodation and diversity with instructors.

To create sustainable change, OC is working to emphasize instructor involvement over top-down directives to experience and share the benefits of inclusion. For example, instructors noted that while female apprentices represent only 4 percent of carpenters in their classes, they make up 30–40 percent of those considered outstanding in terms of their expected contribution to the industry; similarly, female welders are

often recognized for their exceptional precision and top marks for both practical and theory frequently go to females in all trades. One of the authors has also observed a marked increase in tone and professionalism on site and in the classroom immediately when there are females present. Providing opportunities for instructors to share these understandings beyond casual conversations will be critical toward strengthening their resolve to close the gender gap. OC is also working to create a more engaging training environment, collaborating with industry representatives to widen perspectives on who is working in trades today and to highlight their contribution to the industry and the community. The women in trades panel at the BC Indigenous Apprenticeship Forum, for example, discussed how successful they can be as forepersons and leaders because they respect their workers and their bosses and are willing to learn and nurture others (2024).

Aside from instructor support and encouragement, mentorship is critical to success for females in trades (and for other underrepresented groups) (CiCan 2021; IWPR 2021; Masden 2019) and this can start with including female and other mentors willing to share their passion for their trade and engage in activities at the school-age level supported by the college, whether through facilitating volunteer organizations that support SETT such as the Canadian Association for Girls in Science or by hosting camps and events themselves. Developing relationships with industry in these ways can not only support an institution's programs and build recruitment over the long term, including through marketing support, it can support broader allyship across the industry and lead to significant scholarship and equipment donations, participation on program advisory committees and mentorship networks, and increased recruitment of instructors.

In the past five years, there has been significant media focus on trades opportunities and numbers have increased rapidly, attracting younger, more diverse women to the trades (IWPR 2024) although the participation of women and diverse persons is still far below the 15–30 percent needed to move beyond marginalization in SETT (Dever 2021; Engineers Canada 2024;

Gyarmati, *et al.* 2017). Mentors, networking, and support groups are now increasingly available to women in SETT, including for Indigenous (Native American) and Black women (CCWESTT 2024; Heith 2024), but as noted above, these supports need to be available earlier to encourage girls and help override the perception that they don't belong and to continue through their training and employment to support their resiliency. Put together, the strategies above support the system to recognize that a diverse student body enhances the overall quality of graduates and industry itself.

Summary of Recommendations

Colleges and universities offering trades training have an opportunity to increase trades enrollment and address community infrastructure and housing needs by expanding their role in solutions. As noted by CCWESTT (2023), the gender gap in trades is partly created by these institutions and like any system, can be changed by the people now in it, through partnership. Systems thinking encourages examining underlying relationships for impactful change, and SEM provides a framework to manage that change with a longer-term view of recruitment.

Leadership should guide trades departments to reflect on their role in perpetuating exclusionary culture and practices and provide data on gender gaps, best practices, and female experiences to support change. Departments should collaborate with partners to promote trades as a viable career with significant opportunities for advancement and rewarding experience for females through early engagement programs and activities, fostering inclusion from the start. Engaging youth, families, schools, industry, and instructors through hands-on equity experiences that actively create change through transformative inclusion can create space for systemic changes for other underrepresented groups.

Areas for Further Research

OC Trades is now exploring participation, retention, progression, and completion rates by gender across its programs, including a focus on female apprentice retention and alumni engagement with students across

their experience (as per Lowry and Warmack 2025), the participation and success of Indigenous women, and the variation of female and gender-diverse persons' participation between trades. The college recently completed its first SEM plan and is developing an EDISJ strategy that emphasizes transformative inclusion. With new college-level positions dedicated to these efforts, OC Trades can collaborate within the larger college structure and share their experiences with transformational inclusion with other departments, such as Science, Technology and Health.

The OC experience outlined here may be tested and replicated at other institutions working to increase female participation in trades or seeking high-impact enrollment strategies for other underrepresented groups. "Scaling deep" in this way first requires a system-wide willingness to engage with social change in a new way and for institutions to be accountable for their part in it. For example, Soricone (2020) discusses the opportunity for U.S. high schools and colleges to engage more deeply with their partners to change perspectives on trades, providing best practice examples such as the Massachusetts Girls in Trades and Tennessee Pathways programs, and it would appear there is room for Canadian postsecondary institutions to consider a focus on the gender bias toward women in nursing recruitment which has been somewhat successful in the United

States (Canadian Nurses Union 2024; Egan 2024; Munday 2024; Nerges, Hofman, Garrett and Morgan 2022; Twomey and Meadus 2016).

Conclusion

To address the skilled trades shortage and the gender gap in trades, colleges must change how they see their responsibility for it. If SEM provides a framework to adapt to the external environment, as per Hossler and Bontrager (2014), along with the ability to support EDI progress from "rhetoric to measurable action" (Kalsbeek 2023), colleges need to take an active role to change community and family perceptions of gender roles through system-wide awareness and recruitment strategies that address gender bias and culture change. With ongoing media coverage of trades shortages, including stories of successful females, there is an opportunity to shift the conversation from fitting more females into the current system to transforming the system itself. Increasing female participation in trades will require a cultural shift in perspectives on "women's work," which necessitates discussions of equity. Colleges can begin by fostering inclusivity and increasing enrollment for all genders through hands-on engagement with families, schools, and industry—supporting both the current potential of females in trades and the broader vision of de-gendering SETT (CCWESTT 2023).

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Sara Cousins has worked as the Manager, Trades Programs at Okanagan College in British Columbia since 2018. She holds a Graduate Certificate in Strategic Enrollment Management from Royal Roads University, a Certificate in University and College Administration from the University of Manitoba, and a B.A. in Archaeology from Simon Fraser University. The focus of her work has been on Equity, Diversity, Inclusion and Social Justice (EDISJ), whether with and for Indigenous communities in land rights and treaty negotiations or for the provincial and

federal governments in consultation and engagement with Indigenous peoples, advising for the protection of cultural heritage sites, land use or education. Her current role includes strategic planning and SEM, including supporting the participation and success of Indigenous and female students as part of the larger success of trades students, apprentice admissions, connecting local education and industry partners to instructors and students through mentorship and advisory committees. Cousins is the Chair of the BC Apprenticeship Administrators Working Group and advises on provincial level working groups for enrolment

management. She was one of the key authors for the first Okanagan College SEM plan and was instrumental in the priority seat policies for female trades students at her college. Her most recent research focus has been on increasing engagement with families in trades awareness and long-term recruitment. Cousins is a member of the EDISJ Strategy Working Group at Okanagan College, the Canadian Coalition of Women in Engineering, Science, Trades and Technology, and the Women in Construction committee of the Canadian Home Builders Association — Central Okanagan.

**Delacey Tedesco**

Delacey Tedesco is an academic professional with a Ph.D. in political science from the University of Victoria (2016). She taught political theory at the University of Victoria and Human and Urban Geography at the University of British Columbia—Okanagan. She was a lecturer (assistant professor) in critical international relations at the University of Exeter, in Cornwall, UK, from 2017–2022, and remains an honorary lecturer there. Her award-winning research

and teaching focus on both conceptual and practical questions of equity and decolonization, in the southern interior of BC and in international contexts. Tedesco's publications have appeared in journals and edited volumes spanning politics and international relations, human geography, and geohumanities. Tedesco returned to Kelowna in 2022 to become the inaugural cultural advisor with the City of Kelowna, supporting the city's work toward truth and reconciliation and equity, diversity, inclusion, and accessi-

bility. In that role, she has built meaningful community connections, developed staff learning programs, and supported a wide range of municipal planning projects and collaborative initiatives. She joined Okanagan College in March of 2024 as the inaugural associate director of equity, diversity, and inclusion, leading OC's work toward transformative inclusion of, for, and by students, staff, instructors, faculty, and community partners. Tedesco maintains an active, interdisciplinary research program with international collaborators.

**Kelly Brochu**

Kelly Brochu is working at Okanagan College as Construction Trades Chairperson and previously as a vocational instructor for carpentry. Academically, Brochu has a Bachelor of Education from University of Alberta and completed the instrumentation and control engineering technology program at St Lawrence College. The combination of academic and technical training is what steers Bro-

chu's life journey and further resulted in obtaining Journeyperson Certification in both carpentry and scaffolding. Diversity has been widely explored over Brochu's time in the workforce, and he has spent time in the Canadian Armed Forces, teaching at elementary and junior high schools in various areas, including a fly-in school in Northern Manitoba, working as a carpenter and/ or scaffolder, owning a construction business, working as a principal at a small island school off of

Vancouver Island and for the last seven years, at Okanagan College, including recently joining the EDISJ Strategy Working Group. Living and working in so many areas and communities has pushed his passion to see people from any place or situation get the opportunity to not just learn but to understand that regardless of what came before, your new learning journey can start now and can be exclusive of what may have been an unsuccessful learning journey from the past.

**Tanya Tarlit**

Tanya Tarlit has been working at Okanagan College in various capacities since 2005. Starting as an educational advisor, Tarlit moved to vocational instructor, then student, graduator and co-op development coordinator, and currently she is the Trades Program Administrator—working

in various employee groups has given her a unique perspective. Through all these placements, student success is her greatest motivator, and transforming lives and communities is a mission she takes to heart. Her progressive experience in working with dual credit students, women in trades, and students with disabilities allows for a unique perspective

within SEM. Tarlit has a scope of practical expertise that includes programming, curriculum development, recruiting and advising high school and postsecondary students. Her educational credentials include a Master's Degree in Community Development, a Bachelor of Management, a Provincial Instructors Diploma, and a Recreation Administration Diploma.