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Unmasking Gender Norms: Female Pre-service Teachers' Perspectives on Persistent Stereotypes in Western Australia's Technology Education

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Abstract

This article presents the gender-specific findings from a broader doctoral study examining the experiences of pre-service teachers in technology education (TechEd) in Western Australia (WA). Situated within existing scholarship that reveals persistent gender disparities and the underrepresentation of women in technical fields, this study contributes to the conversation by focusing on the experiences of three female participants in a cohort of 10. Using Interpretive Phenomenological Analysis (IPA) methodology and in-depth semi-structured interviews, the study highlights the lived experiences of these future female educators as they navigate traditionally male-dominated spaces.

The findings reveal a persistent undercurrent of bias and stereotypical assumptions that challenge female pre-service teachers' sense of belonging, technical credibility, and authority in the classroom. All three recounted instances of being underestimated by peers or mentors, underscoring the ongoing prevalence of gender-based attitudes. Yet, they also highlighted strategies to assert their competence, such as demonstrating strong technical skills, setting clear behavioural boundaries, and drawing on peer support networks. Additionally, the reflections emphasise the importance of mentorship that encourages inclusive, design-focused practice, rather than reinforcing outdated notions of manual or industrial arts as a masculine domain.

This study contributes to the ongoing discussion of equity in TechEd and emphasises the need for strong institutional support and focused mentoring so women can thrive. By taking these steps, schools can make TechEd more appealing and cultivate learning environments, making the field more accessible and equitable for future female educators.

Key words

gender, Design and Technology, Technology education, equity, bias, pre-service teachers

Introduction

Technology Education (TechEd) has historically evolved from its roots in industrial and manual arts to become a multidisciplinary learning area grounded in design thinking, creativity, and hands-on problem solving (Puddicombe & Williams, 2020). Despite this evolution, TechEd remains one of the most gendered fields in secondary education (Murphy, 2006; Paechter & Head, 1996). While official curricula and national policies have sought to remove historical gender divisions, structural and cultural barriers persist, particularly for female pre-service teachers who enter a profession shaped by male-dominated traditions.

This article presents a focused analysis of gender-related findings from a broader doctoral study on pre-service TechEd teachers in Western Australia (WA) (Puddicombe, 2025). The broader study investigated the motivations, professional identity formation, and pedagogical development of a diverse group of 10 students. This article focuses specifically on the experiences of three female participants, providing a more in-depth exploration of the gender dynamics that arose during the data collection and analysis process. Using Interpretive Phenomenological Analysis (IPA) (Smith et al., 2022), the study investigated how gendered expectations, stereotypes, and institutional contexts shaped women's entry into and navigation of technology teacher education. These narratives reveal the ongoing tension between formal inclusion and informal exclusion and offer insight into how female pre-service teachers assert agency, navigate their professional identity, and influence future learners.

This article extends the conversation on gender equity in technical and vocational education by illustrating how women in TechEd experience, interpret, and respond to systemic bias. It argues that gender remains a powerful factor in shaping participation, belonging, and authority within teacher preparation programs and provides recommendations for teacher educators, schools, and policymakers to create more inclusive and equitable conditions.

Literature Review

Historical Gendering of Technology Education

Traditionally, TechEd evolved from two distinctly gendered domains: boys were directed into manual or industrial arts (such as woodwork or metalwork), while girls were offered home economics (cooking, textiles) (Puddicombe & Williams, 2020). This division was particularly pronounced in WA until the late 20th century, where curriculum design and school structures physically and pedagogically separated students based on gender (Bosworth, 2000). Since 2018, with the introduction of the new curriculum in WA, TechEd has been compulsory for all students up until Year 8, and optional thereafter. Although contemporary TechEd curricula promote inclusivity, enrolment statistics and participant narratives reflect the persistence of cultural residues. Table 1 details enrolments for six subjects in Year 12 for 2022 in WA (Schools Curriculum and Standards Authority [SCSA], 2022). The table indicates that the number of females completing traditional male-oriented subjects is significantly lower, making up approximately 10% across the choices, except for design, where female enrolment is higher than that of males. Design incorporates several contexts, including graphics, photography, technical drawings, and dimensional designs, most of which are digitally based. This division is also reflected in other jurisdictions, including the United Kingdom (UK) (Murphy, 2006).

Table 1:

*Data Showing Enrolments Based on Gender in Western Australia Technology Subjects
(Adapted from SCSA, 2022)*

Subject	Males	Females
Automotive Engineering and Technology	266	26
Aviation	39	3
Building & Construction	433	53
Design *	1023	1247
Engineering Studies **	601	59
Materials Design & Technology ***	2700	805

Note. * has four contexts—photography, graphic design, technical graphics, and dimensional design. ** has two contexts—mechanical engineering and mechatronics. *** has three contexts—wood, metal, and textiles.

Gendered Engagement, Resistance and Structural Inequities

Research from Sultan et al. (2020) and Coulter (2023) shows that girls often perceive technical subjects as masculine domains and may withdraw from or avoid these subjects unless contexts are made relevant and socially meaningful. Sultan (2022) indicated that gender differences in Science, Technology, Engineering and Mathematics (STEM) subjects are evident across the world, but especially in Western countries. She reflected on how the curriculum in TechEd is open to interpretation and the chosen projects tend to lean towards a teacher's preferences. She argued teachers need to create inclusive activities that engage all genders.

Sultan et al. (2020) conducted research to investigate the relationship between technology education and females aged nine to 12 years in primary school. They used ethnographic methods, including observations and focus group interviews, to collect data. The focus group consisted of five female students. Their findings revealed the topic of gender in technology education is complex. The girls perceived themselves as non-technical and preferred tools like glue guns over saws and drills. Girls also tended to work either with other girls or alone. The research concluded teachers should choose gender-neutral assignments to engage both girls and boys to maintain interest.

Coulter (2023) investigated the potential influence of electronic textiles (e-textiles) as a means of challenging and changing gender biases in STEM fields, particularly among school students. This Northern Ireland research used a mixed-methods approach, including questionnaires and practical workshops, with 120 participants from two schools. The effectiveness of e-textiles in shaping student perspectives and promoting gender neutrality was positive. Buchholz et al. (2014) also found that integrating e-textiles and wearable technologies enhanced girls' engagement with electronics, programming, and other STEM activities. By replacing traditional circuit toolkits with e-textiles, girls' participation increased because these technologies offered socially relevant contexts like healthcare, fashion, and athletics, making STEM more relatable and appealing to girls. In their study, Weibert et al. (2014) also found that both boys and girls engaged equally in e-textiles and 'sewable' programmable components. Likewise, Strimel et al. (2019) argued that integrating computational thinking into engineering education, particularly through wearable technologies and programmable e-textiles, could enhance student engagement with core engineering concepts. The evolution of TechEd reflects a move from gendered segregation to inclusivity, yet gender disparities persist, particularly in technology and engineering and relate directly to the number of females choosing to become educators in this field.

Solomka (2023) reinforces this argument, highlighting that perceptions of specific TechEd tasks and artefacts remain strongly gendered, with electronics and robotics seen as masculine and textiles as feminine. Her study revealed that male teachers or peers often redirected even confident female students, limiting their opportunities and reinforcing stereotypes. Demeaning comments and redirected tasks signalled a persistent gender bias in how competence is perceived and rewarded. These findings echo Sultan et al.'s (2020) and support calls for teacher reflexivity and inclusive curriculum framing. Projects with social relevance, such as e-textiles and sustainability challenges, were shown to disrupt gendered engagement patterns and foster broader participation. These findings resonate with Blickenstaff's (2005) analysis of the *leaky pipeline*, a metaphor describing how layered systemic and cultural barriers cause the progressive attrition of girls and women from STEM pathways. She argued that this is not due to innate disinterest or ability but to the accumulation of exclusionary experiences, such as lack of role models, gendered task assignments, and implicit bias, which erodes confidence and belonging. This helps contextualise how girls, even when initially engaged in TechEd, may be gradually marginalised through the subtle reinforcement of masculine norms.

Further international perspectives support these findings. Chimwayange and Davies (2004), in a Zimbabwean study, found girls' TechEd subject choices were shaped by internalised gender norms, perceived subject difficulty, and alienating learning environments. Sadly, belittling comments from male peers and lack of role models reinforced the notion that TechEd was unsuitable for girls. This aligns with earlier studies by Growney (1996), who identified similar peer dynamics and lack of representation as contributing factors to female disengagement despite comparable academic success in the subject area.

Finally, Gaotlhobogwe (2015) and Oats et al. (2019) reported that cultural norms and lack of encouragement from teachers or families influenced girls' participation in Botswana and South Africa. Perceptions of TechEd as a male domain discouraged enrolment and undermined confidence. These patterns mirror Western contexts, suggesting a need for systemic, cross-cultural strategies to address gender disparity in technical education.

Gender and Teacher Identity

Perceptions of gender influence not only student engagement but also career choices. In 2015, Pagram and Cooper (2015) surveyed 173 pre-service teachers in Perth, WA at the university where this current study was also conducted. The objective of the study was to identify the reasons people chose to become TechEd teachers or not. Their findings indicated school experiences played the most significant role in determining preferences for teaching area of pre-service teachers. Many participants had a limited view of the area, mostly experiencing traditional woodwork, metalwork, or technical graphics. Additionally, the researchers were curious about the gender imbalance within the field, where male participation dominated. Although the area was not perceived as "too masculine," (Pagram & Cooper, 2015, p. 9) the study found males felt more comfortable in a workshop setting (38%) as opposed to females (13%).

Ferreira et al. (2025) found that gendered stereotypes continue to shape perceptions of ability and suitability in STEM fields. Their findings suggest pre-service teachers often carry internalised gender assumptions into classrooms, reinforcing bias unless explicitly addressed through reflexive training. They highlight the need for equity-centred teacher education and the importance of institutional intervention in dismantling masculine workshop cultures. Niiranen and Hilmola (2016) documented the emotional labour required to navigate male-dominated teaching environments in their study of female technology teachers in Finland. Participants described symbolic boundary-setting, persistent underestimation, and belittling remarks. These experiences reflect Acker's (2006) notion of inequality regimes and underscore the importance of gender-responsive mentorship and curriculum reform.

Solomka (2023), Niiranen and Hilmola (2016), and Ferreira et al. (2025) suggest that implicit biases within teacher education and school-based mentorship often complicate the identity formation of female pre-service teachers. These biases, when unaddressed, perpetuate the view that women must prove their competence more assertively than their male counterparts, reinforcing the emotional labour burden (Moridnejad et al., 2024). Within TechEd, such dynamics contribute to the ongoing reproduction of gendered expectations and the marginalisation of female teacher identities.

Methodology

This study was underpinned by a theoretical framework aligned with a relativist ontology and constructivist epistemology, supporting an Interpretive Phenomenological theoretical perspective. Drawing on Crotty (1998) and Creswell (2013), the framework provided coherence between philosophical assumptions and research design. Relativism acknowledged multiple, socially constructed realities shaped by individuals' contexts and experiences (Lincoln & Guba, 1985), while constructivism viewed knowledge as co-constructed between the researcher and participant. This epistemological stance supported an interpretivist perspective that sought to explore and understand the pre-service teachers' lived experiences and meaning-making processes within the specific social and cultural contexts (Gray, 2021).

Research Paradigm

Interpretive Phenomenological Analysis (IPA) (Smith et al., 2022) is a qualitative method integrating phenomenology, hermeneutics, and idiography. It allows for the detailed examination of participants' lived experiences, emphasising both individual perspectives and shared meanings. Reflexivity and the co-construction of meaning were central to the research process, aligning with IPA's "double hermeneutic," meaning that "the researcher is trying to make sense of the participant trying to make sense of what is happening to them" (Smith et al., 2022, p. 3).

While IPA had notable strengths, particularly in capturing nuanced, context-specific experiences, it also has criticisms. These include concerns about subjectivity, language limitations, and the representativeness of small sample sizes (Pringle et al., 2011; Willig, 2007). Despite these critiques, proponents argued that IPA's depth of analysis and emphasis on participants' meaning-making processes makes it a valuable approach for educational and identity-focused research (Finlay, 2009; Noon, 2018).

The research question guiding the broader doctoral study was: *How do pre-service teachers of Design and Technology interpret their personal experiences in shaping their professional beliefs and practices?* While the wider study explored various formative experiences, including the participants' educational backgrounds, motivations for choosing teaching, university coursework, and professional placements, this article focuses specifically on the gendered experiences of the three female participants. Although gender was not the initial focus of the research, these participants raised recurring concerns about gender bias, stereotyping, and perceptions of credibility.

Participants

A purposive homogeneous sampling strategy was used to select individuals who were in their fourth year of a Bachelor of Education (B.Ed.) program majoring in TechEd (Patton, 2002; Saunders et al., 2012). This approach aligned with IPA, which emphasises in-depth exploration of a few cases to uncover nuanced insights into participants' lived experiences (Smith et al., 2022). Three female pre-service teachers (pseudonyms - Susan, aged 22, Rosie, aged 21 and Leila, aged 42) consented to participate in the study. At the time of recruitment, all participants had completed relevant TechEd curriculum units and two professional placements and were preparing for their final placement.

Data Collection

The data collection method employed in this study was in-depth semi-structured interviews, which was selected for its alignment with IPA and the capacity to elicit rich, detailed accounts of participants' lived experiences through open discussions (Smith et al., 2022). The approach enabled participants to reflect on their beliefs while allowing for flexibility in the direction of the conversation. Semi-structured interviews are well suited to IPA because they offer a balance between guiding the discussion and allowing participants to explore issues they perceive as significant (Smith et al., 2022). Each participant engaged in two interviews, one prior to and one following their final professional placement, which allowed for insights into how their beliefs had evolved over time.

All interviews were audio-recorded and transcribed verbatim in accordance with IPA guidelines (Smith et al., 2022). The data for each participant were securely stored in individual folders, and transcripts were edited for accuracy against the original audio. Transcripts were exported into both Adobe PDF and Microsoft Word formats for reference and analysis. To enhance credibility, member checking was conducted by providing participants with their transcripts in PDF format. This allowed participants to verify the accuracy of their accounts, thereby contributing to the trustworthiness of the data (Guba & Lincoln, 1989).

Data Analysis

Data analysis followed the seven-stage process outlined by Smith et al. (2022). After transcription, the interview data were then analysed line-by-line. Each transcript was read multiple times while listening to the corresponding audio recording, enhancing familiarity with the data and facilitating immersion in the participant's narrative (Smith et al., 2022). Exploratory comments were recorded alongside each sentence and refined through repeated readings. These initial notes were used to develop experiential statements; concise interpretations that remained grounded in the participants' accounts. These were then clustered to identify connections and patterns, forming the basis of personal experiential themes for each participant (Noon, 2018; Smith et al., 2022). Following the development of the personal themes, cross-case analysis was undertaken to examine patterns of convergence and divergence across participants, which informed the generation of group experiential themes (Smith et al., 2022).

Ethics

The university's Human Research Ethics Committee granted ethics approval for the study. Given the researcher's role as coordinator of the TechEd program and prior teaching relationship with participants, measures were taken to minimise potential bias. A third party conducted recruitment, and participants were assured that their involvement was voluntary and would not affect their academic standing. Informed consent was obtained, and confidentiality procedures were implemented to protect participants' identities. Ethical considerations were maintained throughout the research process, with particular attention to reflexivity and participant wellbeing following IPA guidelines (Smith et al., 2022).

Findings

While the broader study did not initially focus on gender, a significant theme emerged from the interviews with the three female participants. Each shared experience they attributed to their gender, prompting a deeper analysis of their accounts. The analysis revealed two themes central to their gendered experiences: *Gender Dynamics* and *Female Influence*, as illustrated in Table 2.

Table 2:
Group Experiential Themes (GETs) Identified Through the Grouping of Personal Themes for Gender Beliefs

GETs identified	Susan	Rosie	Leila
Gender dynamics	Equity and professional experience	Gender dynamics and classroom authority	Gender dynamics and professional interactions
Female influence	Female influence and student engagement	Assertiveness	Effective boundary setting

4.1 Gender Dynamics

All three participants identified gender dynamics as a salient and recurring theme. While each participant navigated distinct challenges, their narratives consistently reflected the need to assert competence, negotiate authority, and respond to gendered assumptions in both university and school settings.

Susan reflected on formative experiences of exclusion during her own secondary education, recounting how her Year 10 teacher openly questioned her capacity to engage in practical work, “my teacher, my male teacher at that time, he didn’t believe females could do woodwork.” Although her later schooling and placement experiences were more equitable, with her commenting “they didn’t care; it was like, so you’re a female in D&T, so what. You enjoy it. And it was just good”. Interestingly, she explained the earlier encounter helped shape her awareness of gendered expectations in the subject and her motivation to support inclusive practice.

Rosie reported mixed experiences, noting that although she was generally accepted by her male peers at school, she was often “babied and helped more” because of her gender. She described the need to assert her authority early at university, “there’s a few boys, and when we first started, there was a bit, for example, John said something and I just bit back with whatever, and that kind of just established that I wasn’t going to be walked over.” She also identified a competitive dynamic among some female peers at university, “With the other girls, I feel a little bit competitive, not me, but there is the competition that goes on”, but also found meaningful collaboration, especially with Leila, who “shares everything and she’s like awesome.” Through consistency, technical fluency, and clear expectations, Rosie worked to position herself as a capable and credible educator.

Both student and mentor interactions shaped Leila’s experiences. In her first placement, she was initially dismissed by male students who neither sought her assistance nor engaged with her. As she explained, “it’s kind of hard to help people believe in your capabilities sometimes as a woman.” However, when students observed her welding and coding skills, their attitudes shifted: “Once the boys established that I knew how to cut something on the bandsaw, and I knew how to weld, and I understood code ... they started just coming in and looking for me and saying, ‘Oh, Miss helps me’”. In confronting inappropriate behaviour, Leila responded with direct boundary-setting: “Do you have a mother or a sister or a grandmother? ... Would you like anybody to say the things that you just said to me? ... We all deserve respect.” These encounters, combined with experiences of gendered expectations in her personal life, reinforced her resolve to challenge stereotypes and assert her professional legitimacy.

4.2 Female Influence

The theme of female influence emerged as a distinct and meaningful feature of their placement experiences. Their presence as competent, confident, and approachable female educators played a key role in shaping student engagement, particularly among girls, and contributed to reframing perceptions of who belongs in TechEd spaces.

Susan described how her presence appeared to create a sense of comfort and connection for female students, observing that “it was like they were waiting for someone like me to walk into the room.” She recalled feedback from her placement supervisor noting that several girls “were gravitating around me the whole lesson because ... they had that female influence in there.” These reflections suggest that visibility alone functioned as an important relational cue for young girls. She also reflected on how broader institutional representation may have contributed to this sense of inclusion, noting, “I don’t feel like we [females] were treated any differently here [university]. I feel that we were treated the same. I don’t know if that has to do with having female lecturers from the start.” This comment suggests that female educators at multiple levels of the educational pipeline may reinforce a sense of legitimacy and belonging in TechEd contexts.

Reflecting on her position as the only girl in her senior high school TechEd class, Rosie remarked, “I was the only girl, so I think I got a bit more freedom. That if you want to do that you can, a bit of favouritism, sadly. But you know, it is what it is.” This representation took on added significance when she won the top award in the woodwork subject during secondary school, surprising both staff and

classmates, “people were surprised that a female took out the top prize for the subject.” These experiences shaped her early awareness of gendered expectations and visibility in the field. During her placements, she observed how this visibility continued to matter, noting, “the female students have absolutely loved it, because they’ve seen that you can go and do that,” highlighting how her presence as a confident female signalled new possibilities for student participation.

Leila’s female influence was grounded in her ability to model technical fluency and professional resilience. Her confident use of traditional and modern technology challenged students’ assumptions about who can teach TechEd. As her abilities became clear, male students started to approach her for assistance, recognising her expertise and expanding their views on gender roles within the workshop. Leila believed that visibility mattered, stating, “there needs to be a female image for the students to see, male and female students; to see and understand that I’m just as capable. Doesn’t matter what gender I am.” Through both her actions and convictions, Leila positioned herself as a role model, advocating for greater female representation and normalising the presence of women in workshops.

All three participants expressed a shared belief in the importance of being a visible female presence. They highlighted the need for students to see women confidently leading in workshop spaces to challenge assumptions and promote equity. Their reflections suggest female pre-service teachers in TechEd serve as more than instructors; they become role models who shape student identity, foster inclusive participation, and actively disrupt entrenched gender norms through their everyday presence and practice.

Discussion

This study affirms the persistence of gendered structures in education and highlights how female pre-service teachers navigated these conditions through both resistance and role modelling. The findings correspond with international scholarship on the challenges women face in technical education fields (Blickenstaff, 2005; Sultan et al., 2020) and extend this work by offering insight into the Australian context, where historical divisions in curriculum and workshop spaces have left enduring cultural residues (Bosworth, 2000; Puddicombe & Williams, 2020). Despite policy changes mandating TechEd for all students up to early secondary years, the masculinisation of subjects such as woodwork, metalwork, and engineering continues to influence both student enrolment patterns and the professional identity formation of female educators (SCSA, 2022). This pattern is not unique to Australia as international studies confirm that entrenched cultural perceptions of TechEd as a male domain persist in both Western and some non-Western contexts (Chimwayange & Davies, 2004; Gaotlhobogwe, 2015).

Negotiating Gender Dynamics and Professional Credibility

All three described experiences that required them to negotiate their gender in relation to professional credibility. Rosie and Leila, in particular, encountered overt and covert gender bias from students and colleagues. Leila recounted being dismissed by male students until she demonstrated technical fluency; Rosie felt she had to ‘prove herself’ to male peers and students in order to gain respect. These findings are consistent with both Niiranen and Hilmola (2016) and Moridnejad et al. (2024) who argue that women in technical fields must continually re-establish their authority to be perceived as competent. The persistence of patronising behaviours and the burden of ‘proving oneself’ further echoes Blickenstaff’s (2005) concept of the *leaky pipeline*, whereby subtle exclusions contribute to the attrition of women in STEM fields. These dynamics mirror findings by Solomka (2023), who noted that females are often redirected away from technical tasks and careers.

These participants were not passive in the face of these challenges. Each enacted forms of professional agency to disrupt normative gendered expectations. Leila’s strategic boundary-setting, Susan’s confident engagement with workshop culture, and Rosie’s assertive classroom management all reflect what Coulter (2023) describes as *affective labour*, which is the often-unseen emotional and relational work female educators perform to claim space in masculine environments. These findings extend Sultan

et al.'s (2020) conclusion that resilience among female STEM educators is not innate but cultivated through context-responsive strategies that balance authority, care, and competence. This also aligns with Niiranen and Hilmola's (2016) findings that female teachers in TechEd often engage in symbolic boundary-setting and experience persistent underestimation, further illustrating the emotional burden associated with asserting legitimacy in these spaces.

Role Modelling and Gendered Influence

A strong theme across the dataset was the perceived impact of the participants' presence on female student engagement. Each participant observed that their visibility in the workshops had a symbolic and practical influence on girls' participation. Susan and Rosie described how female students gravitated toward them for guidance and affirmation, while Leila framed her presence as a necessary challenge to dominant narratives about who belongs in workshop spaces.

These experiences reinforce the importance of gender-congruent role modelling in educational settings. Sultan et al. (2020) and Buchholz et al. (2014) found that girls are more likely to engage in STEM fields when they see women teaching those subjects, particularly when the teachers model both relational and technical confidence. The findings in this study extends this by demonstrating that such role modelling also influences boys' perceptions. Leila's account of male students shifting from scepticism to respect upon witnessing her competence suggests that visibility can recalibrate gendered assumptions among all students, not only girls. These findings are consistent with international literature, including Weibert et al. (2014), who found that both boys and girls benefit from diverse role models in e-textiles education, particularly when technical and relational strengths are modelled simultaneously.

Moreover, participants articulated the view that representation alone is insufficient without professional legitimacy. Visibility, in their experience, had to be accompanied by demonstrated technical skill and firm boundaries to generate cultural change. This resonates with Paechter and Head's (1996) emphasis on credible representation, the idea that equity is achieved not simply through presence, but through the authority to act meaningfully within that presence.

Intersections of Gender, Experience, and Curriculum

While agency and influence were evident, the participants also exposed the limitations of individual strategies in the face of broader structural constraints. Leila's experience of marital conflict and institutional gatekeeping reflects the socio-cultural costs women may bear in pursuing non-traditional career paths. Further, the participants' reflections revealed that the content and delivery methods remain implicitly gendered. Projects focused on traditional materials and skills were rarely framed through inclusive or socially relevant lenses. This supports Coulter's (2023) assertion that the cultural framing of TechEd often reproduces masculine norms, thereby discouraging diverse participation. Solomka (2023) similarly reported female students were steered toward activities perceived as less technical. Participants' desire for more integration of digital technologies, sustainability themes, and student-led projects mirrors international calls for curriculum renewal and positions TechEd as a design-led, future-focused discipline.

Implications for Teacher Education and Policy

The findings underscore the need for systemic reforms in initial teacher education programs and school placements. Mentorship must be intentional and equity-focused, with pre-service teachers placed in environments where inclusive practices are modelled and valued. As the data show, the quality of mentorship varied considerably, with some teachers reinforcing stereotypes and others actively supporting female candidates. This variability points to the need for professional development targeting unconscious bias and gender-inclusive pedagogy. Ferreira et al. (2025) reinforce that reflexive, equity-centred training is essential if pre-service teachers are to disrupt rather than reproduce masculine workshop cultures. Teacher education institutions must also adopt more explicit strategies for embedding equity into the curriculum, not only in terms of what is taught, but who is teaching it, how it is taught, and whose perspectives are centred. As Buchholz et al. (2014) argue, gender equity in STEM

is not achieved through neutral curricula but through purposeful disruption of the cultural and pedagogical norms that reproduce inequality.

At a policy level, targeted recruitment strategies and improved visibility of female TechEd educators are essential. Promotional narratives must move beyond slogans to demonstrate relevance across gender identities, cultural backgrounds, and career pathways. Expanding the scope to include socially and environmentally responsive design can create more meaningful entry points for diverse cohorts and better reflect the realities of contemporary technological practice. As Sultan (2022) notes, TechEd teachers hold significant power to shape inclusivity through their selection and framing of projects, decisions that can either reinforce or challenge gendered assumptions in the classroom.

Participant Limitation

While the emergence of gender as a key theme added valuable insight to the study, it is important to acknowledge that only 3 of the 10 participants identified as female. Given the number of female participants, the gender-related findings represent a limited set of individual perspectives. These insights are intended to illuminate particular lived experiences rather than to be interpreted as broadly representative of female pre-service Technology Education teachers. The experiences captured may not reflect the full range of gendered dynamics in different educational contexts or among individuals from varied cultural, socioeconomic, or age backgrounds.

Recommendations for Future Research

This study foregrounded the under-examined gendered dynamics within technology teacher education, made possible by the participation of three female pre-service teachers. Their narratives illuminated gendered assumptions, power differentials, and the relational labour required to establish credibility, issues not initially anticipated in the doctoral study. Future research should more deliberately investigate the experiences of female pre-service and early-career teachers to identify the systemic barriers to participation, retention, and progression in the profession. In particular, longitudinal research that tracks graduates' career trajectories could offer insight into how gender dynamics evolve across the transition from university to full-time teaching. Moreover, research that evaluates gender-sensitive pedagogical interventions or policy reforms, such as inclusive curriculum frameworks, mentorship models, or equity-focused professional placements, would contribute to evidence-based strategies for supporting women in TechEd. By designing research through explicitly gender-inclusive and intersectional lenses, scholars can advance both theoretical understanding and practical outcomes that support more equitable and sustainable pathways into the field.

Closing remarks

This study has provided a nuanced exploration of the experiences of female pre-service teachers in WA, revealing how their personal histories, institutional environments, and professional placements shape their evolving beliefs and pedagogical practices. Through an IPA approach, the study foregrounded the voices of three females, generating insight into the complexities of teacher formation within a discipline that merges practical, creative, and technical dimensions.

The accounts of the three female participants illuminated ongoing challenges in navigating male-dominated workspaces, including experiences of stereotyping, diminished expectations, and inequitable professional treatment. Despite national policy frameworks that advocate for inclusivity, the realities described in this study point to systemic issues that continue to marginalise women in the field. Importantly, these participants also demonstrated agency, resilience, and commitment to equity. The female pre-service teachers actively challenged normative assumptions by modelling technical competence, establishing firm professional boundaries, and fostering inclusive learning environments.

They contributed to shifting cultural perceptions of who belongs in workshops. Their visibility had a positive influence not only on female students but on the broader learning community, reinforcing the importance of diverse representation.

The study further underscored the centrality of mentorship, curriculum coherence, and practical learning in shaping confident and competent educators. Effective mentorship, particularly when aligned with values of respect, support, and high expectations was found to play a pivotal role in reinforcing female pre-service teachers' professional identity and pedagogical approach. As TechEd continues to respond to changing technological, societal, and educational demands, this research highlights the need for targeted interventions that address structural inequities while strengthening teacher preparation. Embedding gender-inclusive pedagogies, establishing equity-focused placement partnerships, and supporting ongoing professional learning are needed to foster a more diverse and sustainable teaching workforce. The findings make a meaningful contribution to current conversations about recruitment, retention, and representation in TechEd, suggesting pathways for more inclusive and responsive teacher education in the future.

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