Chapter 6
Gender-Inclusive Pedagogies in Computer Science Education:
Insights, Implications, and Future Directions

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ABSTRACT

Despite growing demand for computing professionals, women remain significantly underrepresented in computer science education and technology careers. This chapter presents a narrative review of literature on gender-inclusive pedagogies, examining classroom practices, curriculum design, assessment strategies, mentorship,

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and institutional initiatives that support female learners' engagement, persistence, and sense of belonging. Drawing on international and regional studies, the review identifies effective approaches such as collaborative learning, identity-affirming and real-world curricula, formative assessment, and structured support systems, while highlighting persistent gaps including Western-centric perspectives, limited intersectional analyses, and misalignment between policy rhetoric and classroom practice. Grounded in technofeminist theory, the chapter discusses implications for educators, institutions, policymakers, and future research aimed at advancing equity in computing education.

INTRODUCTION

In an era defined by rapid digital transformation, gender disparities in computing remain a persistent global concern (Ashlock & Tufekci, 2024; Fietta et al., 2023; Perez-Felkner et al., 2024). Despite substantial progress in access to education and workforce participation, women continue to be underrepresented in computing fields both in academia and in industry. According to the World Economic Forum (2023), women comprise only about 28% of the global STEM workforce, with their participation particularly low in computing-related roles. In the technology industry, women account for roughly 25% of technical positions and an even smaller share of leadership roles (Forbes, 2024). Within software development, the imbalance is even more pronounced as over 90% of developers identify as male.

These figures are often interpreted through the lens of a persistent "leaky pipeline," where women's representation diminishes progressively from education to employment, as access to computing fields remains shaped by gendered cultural capital, socialization patterns, and institutional pathways that disproportionately advantage male-dominated trajectories. However, recent critical scholarship cautions that this metaphor risks producing static and deficit-oriented accounts of women's participation in computing. Vitores and Gil-Juárez (2016) argue that decades of research framed around the leaky pipeline have paradoxically contributed to a sense of inevitability by focusing on women's attrition rather than interrogating how computing itself is socially constructed and institutionally organized. They highlight that, despite growing participation of women across most STEM fields, computing remains an outlier and that the problem lies with entrenched disciplinary cultures, research assumptions, and policy framings that continue to reproduce gendered exclusions.

These global patterns are mirrored at regional levels. Within the European Union, for instance, women comprise 52% of the overall science and technology workforce yet remain significantly underrepresented in information and communication technology (ICT) professions (Eurostat, 2024). Eurostat (2023) data show that men