Professional Empowerment of Women in Technology: An Analysis of Student's Participation in WordPress Volunteering at the Faculty of Computer Science, Universidad Fidélitas, Costa Rica.[1⋆]

Ing. Rita Robles Loaiza[1,†], Ing. Elineth Morera Campos[2,*,†]

[1] *Universidad Fidélitas, San José, Costa Rica*
[2] *Universidad Fidélitas, San José, Costa Rica*

Abstract

This study explores how women studying computer science experience professional growth when they take part in volunteer roles within the WordPress community. To better understand this connection, we conducted a qualitative study using ten semi-structured interviews with students from the Faculty of Computer Science at Universidad Fidélitas in Costa Rica, all of whom have volunteered on WordPress-related projects. Through a thematic analysis, we identified the motivations that drew them in—such as gaining hands-on experience and giving back to the community—as well as the benefits they perceived, including strengthened technical and social skills, increased confidence, and the development of leadership abilities.

The women also described the challenges they encountered, ranging from persistent gender stereotypes to the difficulty of balancing studies, personal life, and volunteer commitments. Overall, the findings suggest that participating in free and open-source software (FOSS) communities gives women a supportive environment where they can build a stronger professional identity, expand their networks, and gradually assume leadership roles. These experiences may contribute to closing the gender gap in the technology sector.

The study concludes by discussing the implications of these findings for broader inclusion efforts in Information and Communication Technologies (ICT). It also highlights a series of promising practices that can help foster sustained participation and empowerment among women in technology-oriented communities.

Keywords

Women's empowerment, women in technology; volunteering; free and open-source software (FOSS); open source communities; WordPress.

1. Introduction

Women's participation in science, technology, engineering, and mathematics (STEM) remains a global challenge. Their presence in computing and technology programs is still noticeably low [1]. This underrepresentation not only reduces the diversity of voices shaping the field but also limits women's access to professional opportunities and the kinds of skills that technological environments typically foster [2]. In the world of free and open-source software (FOSS), for instance, women make up only about 10% of contributors—an imbalance that clearly reveals the gender gap [3]. This disparity is significant because women are not benefiting equally from the

[1⋆] *XVII Congress of Latin American Women in Computing 2025, October 27–30, 2025, Valparaíso, Chile.*

rrobles@ufidelitas.ac.cr (R. Robles); emorera@ufidelitas.ac.cr (E. Morera)
0009-0003-7257-7597 (R. Robles); 0009-0000-4359-090X (E. Morera)

career advantages, learning pathways, and professional visibility that open-source participation often provides [2][4].

Researchers have examined the roots of this gender gap, pointing to a combination of sociocultural and structural factors. Deeply ingrained cultural stereotypes—for example, the notion that computing is naturally a "male domain"—tend to discourage women's involvement, narrow their opportunities, and ultimately hinder their professional empowerment [5]. Cheryan and colleagues (2015) found that these persistent stereotypes do more than exclude women from the benefits of technology; they also erode their confidence to contribute or lead in the field, shaping their long-term career decisions [5]. Even so, studies show that women's participation in technology can grow when inclusive spaces and meaningful development opportunities are intentionally created [6]. Along this line, inclusion initiatives and targeted programs have played an important role. In a review of successful cases, Fletcher and Thompson (2019) highlight that women's empowerment in technology becomes attainable when discriminatory barriers and gender bias are directly addressed, especially through structured initiatives designed to promote digital inclusion [7]. International organizations have echoed this message, emphasizing the need for public policies and educational strategies that reduce the digital gender divide and equip women to thrive in today's digital economy [8].

Across Latin America, these recommendations have inspired various gender-focused digital education policies and programs aimed at closing participation gaps in Information and Communication Technologies (ICT) [6][8][9].

In today's digital era, women's professional empowerment in ICT is tied to developing technological competencies, building strong support networks, and increasing their visibility within the field [9][10]. Here, empowerment refers to the ability of women to take charge of their career paths, access decision-making roles, and strengthen both their confidence and autonomy in settings historically dominated by men. While recent studies in Latin America show signs of progress, they also reveal that many women still struggle to fully recognize their own potential to lead or direct their professional growth in ICT [11]. Research from Ecuador, for example, found that only half of the women surveyed felt capable of steering their own careers in technology, 40% were uncertain, and 10% did not feel capable at all [11]. These findings highlight that, although attitudes are improving, a significant number of women have yet to build a solid sense of confidence in their abilities—pointing to the urgent need for environments and experiences that help strengthen that belief.

Free and open-source software communities, such as WordPress, offer a promising space for this kind of empowerment early in a woman's academic journey. These collaborative technical communities give participants the chance to learn by doing, exchange knowledge, and contribute to real projects that have global reach. For many women, volunteering in open-source initiatives becomes a valuable opportunity to build technical skills, grow professional networks, and begin positioning themselves within the broader tech ecosystem—well beyond the classroom [1]. Volunteering can also act as a catalyst for career development. Studies have shown that young people who volunteer are more likely to find employment and advance professionally. One report found that volunteering is associated with a 27% higher chance of securing a job, and that employers often view volunteer experience as a meaningful asset on a candidate's résumé [12]. In the field of information technology, contributing to non-paid open-source projects—whether through coding, event organization, documentation, or support—can showcase a person's abilities, elevate their visibility, and expand their professional network, all of which can positively shape their career trajectory.

Guided by this perspective, the present study examines the volunteer experiences of university women participating in WordPress initiatives. WordPress—one of the most widely used free software projects worldwide—has an active community that organizes events (such as WordCamps and meetups), develops code, translates materials, and provides support, largely through voluntary work. Within this global ecosystem, several efforts have emerged to increase women's participation, given their historical underrepresentation in open-source communities [3].

Interestingly, informal reports from the WordPress community suggest that it may be more inclusive than other tech-related projects, with a growing number of women taking on event-organizing roles, giving talks, and contributing in non-coding areas such as design and documentation [13][11]. This article presents an exploratory analysis of how volunteering in WordPress has shaped the professional development and empowerment of women studying computer science. We seek to understand their motivations, the skills and confidence they gained, and the challenges they faced, ultimately offering recommendations to encourage and sustain women's inclusion in open-source technology communities.

2. Theorical Framework: Empowerment and Gender in Technology

Women's empowerment in technological fields is generally understood as a process through which they gain agency, skills, and meaningful opportunities that allow them to shape their own professional paths and influence the environments around them [15]. From the perspective of the capabilities approach, expanding women's autonomy and strengthening their abilities is essential for addressing gender inequalities [27]. In the ICT sector, empowerment involves far more than technical training—it also requires dismantling the cultural and organizational barriers that have historically limited women's participation and advancement. The literature identifies a series of structural challenges: early educational biases, workplace cultures that fail to include or support women, and the chronic lack of visible female role models in technical professions [5][7]. Cheryan et al. (2015), for example, demonstrate how stereotypes—such as the image of the "male, solitary programmer"—can erode women's sense of belonging in computer science programs, affecting both their performance and their persistence in the field. These obstacles contribute to women's underrepresentation in advanced stages of tech careers, including leadership and specialized positions. Still, research consistently shows that when supportive conditions and targeted initiatives are put in place, women can thrive and fully develop their potential in technology [6]. Mentoring programs, women-led networks, and equity-oriented policies within tech companies have yielded promising results in reducing gaps in participation and career progression [9].

A central component of empowerment in technology is the development of professional confidence and self-efficacy. Bivens (2020) argues that closing the gender gap in tech requires not only providing women with access to training and digital tools, but also nurturing the confidence needed to innovate, take risks, and step into leadership roles [16]. This idea aligns with the concept of technological self-efficacy [25]: when women genuinely believe that their contributions are valuable within technical environments, they tend to engage more actively and aspire to higher-level positions [25][19]. Conversely, the lack of visible female role models and the persistent undervaluation of women's skills can weaken that sense of self-efficacy. In one study, only 55% of women working in ICT considered themselves role models for others—partly because their achievements were not sufficiently recognized [16]. This underscores the importance of highlighting women's leadership in technology and fostering communities of practice where their contributions are acknowledged and reinforced.

3. Participation in Open-Source Communities

Open-source and free-software communities occupy a unique place within the broader tech ecosystem. They rely on voluntary collaboration, transparency, and merit-based contribution, and they function across geographical and cultural boundaries. Despite these strengths, such communities have long struggled with issues of diversity. Research on women's participation in open-source projects shows a persistent and significant gender gap: global estimates suggest that only about 9–10% of contributors identify as women [3]. Their representation in highly influential roles—such as core maintainers or lead developers—is even lower, often around 5% [4]. Scholars have traced this disparity to a mix of social and technical dynamics. Barriers to entry, including communication environments that can be unwelcoming or hostile, as well as unconscious bias

during code review, often discourage women from staying active in these spaces [17]. Trinkenreich et al. (2021) note that the most frequently cited obstacles for women contributing to open-source software are social in nature. These include the lack of female peers with whom to share experiences (peer parity) and communication practices that reflect competitive or exclusionary technical cultures rather than collaborative ones [17]. These factors shape the perception held by many women that open-source environments are not designed with them in mind, leading to higher dropout rates and reduced visibility of their contributions.

Even so, the landscape is gradually shifting. There is growing evidence that open-source communities can offer powerful opportunities for professional development when the right conditions are in place. For many women, contributing to a free-software project provides a chance to learn new tools, work on meaningful problems, and connect with professionals outside traditional academic or corporate structures [18]. Motivations such as altruism—the desire to "give back" to a community—and a sense of affinity or belonging (kinship) have been shown to play a central role in sustaining women's participation in open-source projects [18]. When these motivations are supported—through positive mentoring experiences, inclusive communication practices, or peer networks—retention and long-term engagement tend to improve. Receiving recognition for their contributions, such as having their code accepted at equal or even higher rates than male contributors [4], can further reinforce women's confidence and encourage deeper involvement.

4. WordPress Initiatives

Within the WordPress ecosystem, several initiatives have been launched to promote inclusion and address longstanding gender imbalances. Around the world—and notably in Costa Rica—the community has organized events such as Women WordPress Day and women-led activities during International Women's Day. These spaces have encouraged many women to take their first steps into public speaking, lead technical workshops, or simply attend a tech event without feeling isolated or out of place [19][20]. The outcomes have been consistently positive: participants reported feeling welcomed, valued, and more confident about engaging in future events [21]. In some cases, this initial involvement sparked long-term engagement, creating a ripple effect. Women who took on their first organizational roles often continued doing so, eventually becoming leaders within their local WordPress communities [20][20]. These experiences suggest that when open-source communities intentionally create supportive environments, they become powerful spaces for empowerment—places where students can apply their knowledge, develop new skills, and challenge the gender norms that remain common in traditional tech spaces.

5. Methodology

To examine how WordPress volunteering contributes to women's professional empowerment, this study adopted a qualitative research approach using an intrinsic case-study design. The case of interest centers on the experiences of women studying computer science who participated as volunteers in the WordPress community associated with Universidad Fidélitas and its surrounding local network. The following section outlines the methodological design used throughout the research process.

The sample consisted of ten women between the ages of 20 and 25, all enrolled in the Faculty of Computer Science. Between 2023 and 2025, these students actively volunteered in various WordPress initiatives. Most were in the middle or final stages of their bachelor's degree programs. Participants were selected through non-probabilistic convenience sampling by contacting students known for their involvement in local WordPress events (such as WordCamp San José, local meetups, and WordPress Diversity workshops). Prior to data collection, each participant signed an informed-consent form guaranteeing the confidentiality of their identity and ensuring that their statements would be used only for research purposes.

Data were gathered through individual semi-structured interviews conducted either in person or via videoconference, depending on each participant's preference. On average, interviews lasted approximately 45 minutes. The interview protocol explored four central themes:

1. Motivations for joining WordPress volunteering — what sparked their interest and what they hoped to gain;
2. Experiences and learning outcomes — the roles they performed, the technical skills acquired, and the development of soft skills such as teamwork, communication, and leadership;
3. Perceived professional impact — how volunteering influenced their confidence, career opportunities, networks, and future outlook in IT;
4. Challenges and barriers — difficulties related to gender, time management, community dynamics, or other factors.

With participants' permission, all interviews were audio-recorded and later transcribed verbatim to facilitate detailed analysis.

6. Data Analysis

The study employed thematic analysis [22], supported by qualitative analysis software (Atlas.ti [26]). To begin, both authors read the full interview transcripts to gain familiarity with the data. They then carried out an open-coding process, identifying segments of text that were relevant to the research question. From the initial list of codes—such as "improving technical skills," "lack of confidence at first," "support network," "feeling like a role model," and others—emerging themes were grouped and refined.

Through iterative discussion and revision, the researchers consolidated five main thematic categories that captured the essence of the participants' experiences:

- Motivations for participation
- Development of technical skills
- Growth in social skills and leadership
- The role of community and support networks
- Challenges encountered during volunteering

To ensure reliability, both investigators independently reviewed the transcripts and compared their coding decisions. Any differences or interpretive nuances were resolved by consensus, ensuring that the final themes accurately reflected the participants' narratives. Given the intentionally small and localized sample, the results are not meant to be statistically generalizable; instead, they offer an in-depth, contextually grounded understanding of the phenomenon under study.

7. Results

The coding and categorization process produced five central themes that describe how the students experienced their volunteer work within the WordPress community and how it influenced their professional development. Below, each theme is presented along with illustrative examples drawn from the interviews. To protect confidentiality, participants are identified as P1–P10.

Table 1
Summary of thematic findings

Category	Main Findings
Motivations	Desire for hands-on learning; applying academic knowledge; participation in global projects; expanding networks; recommendations from professors or friends; curiosity about events; inspiration from female leaders; stepping outside routine; contributing to a global tool.
Technical Skills	Content management and configuration; site optimization; databases and web design; theme and user setup; version control; event logistics; child-theme and CSS creation; Figma use and testing; site migration; forum management; culturally adapted documentation contributions.
Soft Skills	Communication and teamwork; leadership; event organization; time and crisis management; technical writing; public speaking; decision-making; facilitation; conflict resolution; networking; empathy.
Confidence and Professional Projection	Increased confidence in professional settings; participation as speakers; overcoming stage fright; greater proactivity and resilience; stronger networks; sense of purpose and recognition.
Challenges Encountered	Adapting to non-academic dynamics; impostor syndrome; time management; limited prior experience; English-language meetings; contribution structures; shyness in networking; low initial self-esteem.
Suggestions	Create mentorship spaces; document beginner steps; peer-support teams; highlight achievements; offer introductory workshops; formally recognize volunteer work; promote inclusive culture and visible female leadership.

7.1. Motivations for Participation

Participants reported a wide range of motivations for getting involved in WordPress volunteering, often combining several reasons. A common motivation was the desire to gain practical experience

beyond the academic curriculum. Many felt that contributing to WordPress would allow them to apply the theoretical knowledge learned in university to real-world projects. As one student explained: “I saw an opportunity to learn through practical experience and expand my professional network.” (P5, age 20)

Another strong motivator was the wish to give back to a community that had already benefited them. One participant noted: “WordPress has given me so much—I’ve learned a lot from its resources—and volunteering felt like a way to give something back.” (P2, age 21)

Networking also played a significant role: “My mentor suggested I volunteer at WordCamp. She said it would help me make connections.” (P8, age 23)

Finally, several students mentioned that volunteering would strengthen their résumé and help them stand out in future job applications: “Having experience in a global community looks good on a CV.” (P3, age 22)

7.2. Development of Technical Skills

All participants agreed that volunteering in WordPress helped them develop or reinforce relevant technical skills. The specific skills varied depending on the roles they assumed within the community. For example, some students contributed directly to open-source development: “I joined because I’m passionate about open source and wanted to be part of a global community.” (P1, age 24)

Others supported event organization and learned complementary technical and design skills. One participant shared: “I handled basic HTML/CSS to explain it to others,” which helped solidify her own understanding (P6, age 20).

Several participants mentioned improvements in their technical English as they navigated documentation or interacted with international contributors.

7.3. Growth in Soft Skills and Leadership

Beyond technical abilities, a recurring theme was the development of social, communication, and leadership skills. Some participants described starting out timid or unsure, only to gain confidence through community engagement: “At first I was scared to speak or share ideas, but once I saw that the team valued my opinions, I began to open up.” (P7, age 22)

Several women eventually took on coordination roles or led activities: “After coordinating a team, I now feel capable of leading professional projects.” (P3, age 22)

Public speaking also improved noticeably: “After speaking in front of 50 people at a WordCamp, presenting in class no longer feels intimidating.” (P8, age 23)

7.4. Community Support and Sense of Belonging

A strong cross-cutting theme was the importance of community support. Many participants emphasized that, unlike the competitive environment they expected, they found WordPress to be largely welcoming and collaborative. They especially valued the presence of other women in tech. “I had never worked with so many women on a tech project; in most university groups, everyone is male.” (P2, age 21)

Participants highlighted the influence of female role models—experienced organizers or industry professionals who encouraged them and offered informal mentorship. “Whenever I doubted whether I had the skills for a project, there was always someone—man or woman—who encouraged me to keep going.” (P9, age 24)

Some explained that this supportive environment inspired them to mentor newcomers: “Now I also try to guide other girls who join the group.” (P7, age 22)

WordPress thus became not only a volunteer activity but also a community of practice [23] where women built professional identity and emotional support networks—key ingredients for empowerment.

7.5. Challenges and Lessons Learned

Although the overall experience was positive, participants also described challenges. A common struggle was impostor syndrome: many felt they "didn't know enough" or "weren't good enough" to contribute. These doubts gradually faded as they received positive feedback, but nearly all participants admitted experiencing them at some point.

Time management was another recurring difficulty. Balancing studies, personal obligations, and volunteer commitments was especially hard during high-pressure academic periods: "There was a tough semester where I could barely attend meetings. I felt bad about it, but I learned to manage my responsibilities better." (P6, age 20)

While none reported direct discrimination within the local WordPress community, some insecurities were reinforced by outside comments. One student recalled a male engineer questioning the value of volunteering because it was unpaid: "Why are you doing that if they don't pay you?"

The remark made her doubt herself at first.

Despite these challenges, all participants concluded that the benefits far outweighed any obstacles.

8. Discussion

The findings of this study reaffirm and expand previous research on women's empowerment in technological environments while offering a nuanced look at the specific dynamics of volunteering within an open-source community. First, the motivations identified in the interviews—gaining practical experience, contributing to a cause, building professional networks, and improving employability—align closely with motivations reported by women participating in open-source projects globally. Prior studies have shown that opportunities for learning and the desire to "give back" are particularly strong motivators for women contributors in open-source ecosystems [18]. In this study, altruistic motivations surfaced clearly, with several participants expressing a wish to return the benefits they had gained from WordPress. This suggests that emphasizing the social mission and collective impact of open-source initiatives may be an effective strategy for attracting more women to these communities.

The interviews also underscored the importance of social capital [24]—especially mentoring and networking—in women's professional empowerment. Access to experienced peers, potential collaborators, and informal career guidance provided added value that complemented their formal academic training. This aligns with theoretical frameworks that highlight the role of support networks in advancing women's participation in male-dominated fields. Our findings suggest that volunteer communities can function as early talent incubators, giving students visibility and helping them build professional connections that may improve future employability. This is consistent with external evidence showing that volunteer work increases job prospects [12]. Encouraging students—especially women—to engage in community-based technological projects may therefore have tangible benefits for their career development.

In terms of skills development, the results show that WordPress volunteering enabled holistic learning: students strengthened both technical and socio-emotional competencies. This dual growth addresses two well-documented gaps in the literature: the technical skills gap, which contributes to women's underrepresentation in programming roles, and the leadership skills gap, which affects their access to decision-making positions. Participants not only practiced coding, design, troubleshooting, and project management but also exercised leadership—coordinating teams, speaking at events, and making decisions under pressure. These experiences serve as early leadership training, which research shows can significantly increase the likelihood that women will seek and obtain leadership roles later in their careers [18]. Many interviewees described a notable increase in their sense of self-efficacy, a key indicator of empowerment. Seeing themselves succeed

in real tasks, receive recognition, and contribute meaningfully allowed them to challenge the internalized doubts associated with impostor syndrome.

Another significant finding is the role of community culture in promoting women's participation and retention. Participants valued the supportive, collaborative atmosphere of WordPress and were particularly encouraged by the presence of other women and visible female leaders. This confirms the importance of intentionally fostering inclusive community norms. Previous studies highlight strategies such as peer-support groups, visible role models, mentoring, and codes of conduct as critical to supporting women in open-source environments [17]. In this case, WordPress provided many of these elements organically, which contributed to participants' sense of belonging. Research shows that women who experience kinship and reciprocity within open-source communities are more likely to remain active contributors [18]. Our study also found that empowerment extended beyond the individual level: several participants began mentoring newcomers, demonstrating what scholars describe as collective empowerment, where empowered individuals then support and uplift others [28]. The local WordPress community appears to have created conditions conducive to this collaborative cycle.

Despite these strengths, the findings also reveal areas where additional support is needed. Although participants ultimately overcame their insecurities, the prevalence of impostor syndrome suggests that many women may hesitate to join or may withdraw early without adequate encouragement. Formal onboarding processes, beginner-friendly pathways, or workshops addressing impostor syndrome could help new contributors navigate these barriers. Time constraints also emerged as a significant challenge. Volunteering requires substantial effort, which may exclude students who lack the financial or personal flexibility to dedicate unpaid hours. Institutions could mitigate this by recognizing open-source participation as part of academic credit, internships, or professional practice hours—reducing the extracurricular burden and increasing accessibility. Partnerships between universities, companies, and communities could also create scholarships or stipends for high-impact volunteers.

In summary, the discussion reinforces the idea that early involvement in open-source technological communities can be a powerful pathway for women's professional empowerment—provided that supportive structures are in place. These findings align with international policy recommendations from UNESCO, CEPAL, and other organizations, which argue that ICT and digital collaboration offer promising avenues for reducing gender disparities by giving women opportunities to develop skills, build networks, and gain visibility in the digital economy [8][10]. The qualitative evidence presented here illustrates how these benefits materialize at the individual level, shaping the real experiences of students who, through volunteering, discovered new career possibilities, strengthened their capabilities, and now face their professional futures with greater confidence and support.

Because this study focuses exclusively on the WordPress community in Costa Rica, its conclusions may reflect cultural and organizational particularities unique to this context. As such, while the results offer valuable insights, they should be interpreted with attention to the local dynamics of this specific open-source ecosystem.

9. Conclusions

This study examined how volunteering within the WordPress community contributes to the professional empowerment of women studying computer science. The findings offer both localized empirical evidence and broader reflections that align with existing literature on gender and technology. Through in-depth interviews, we observed that participation in free and open-source software initiatives can serve as a powerful catalyst for the formation of young professionals: it not only strengthens technical skills but also enhances leadership abilities, expands professional networks, and increases women's confidence to navigate a field traditionally dominated by men.

Specifically, the women interviewed were able to bridge theory and practice by applying academic knowledge to real-world situations, accelerating their learning curves. Just as important,

they found within the community a space of validation and support that counteracted many of the discouraging messages women often receive in technology—such as questioning their abilities or lacking relatable role models. These combined effects contributed to a marked increase in their sense of professional capability. Several participants reported shifting from seeing themselves merely as students to recognizing themselves as valuable members of a global technological community—and even as sources of inspiration for other women. This internal transformation reflects empowerment in action.

These findings resonate with regional digital-inclusion policies promoted by organizations like CEPAL and UNESCO, which emphasize the importance of combining technical training, support networks, and the visibility of female leadership as key strategies for reducing gender gaps in ICT participation across Latin America.

Based on the study's results, several practical recommendations emerge. For universities and computer science programs, fostering student involvement in open-source communities or other extracurricular tech spaces can be highly beneficial. This could take the form of institutional partnerships, active promotion of community events, or even the formal recognition of volunteer work as part of academic requirements. Such experiences enrich formal education and can help improve retention rates of women in ICT programs by offering them a stronger sense of belonging and purpose.

For technological communities, the findings reinforce the importance of maintaining and expanding inclusive practices. Mentorship programs, visible female leadership, clear codes of conduct that ensure respectful interactions, and flexibility for contributors who study, or work are all strategies that make a meaningful difference in attracting and retaining diverse talent [7][6]. Notably, initiatives like Women WordPress Day have proven effective at helping newcomers overcome initial hesitations and encouraging more women to participate actively; expanding these initiatives to additional regions and local contexts would likely amplify their impact.

Acknowledgements

The authors extend their sincere gratitude to the WordPress Costa Rica Community for providing the space and support that made this study possible. We are especially grateful to the student volunteers who participated in the interviews and generously shared their time and experiences. This research was supported by the Research Program of the Faculty of Computer Science at Universidad Fidélitas, which has encouraged the integration of a gender perspective into student-led projects.

Declaration on Generative AI

In line with academic transparency policies, we declare that generative artificial intelligence (AI) tools were used during the preparation of this article to assist with writing and editing tasks. These tools served as complementary aids and were employed under the authors' supervision and judgment. All content was carefully reviewed and validated by the authors to ensure accuracy, coherence, and adherence to ethical standards. The use of AI was limited strictly to streamlining the editorial process; at no point did it replace or diminish the authors' intellectual or analytical responsibility for the research, which remains entirely their own.

References

[1] B. Trinkenreich, I. Wiese, A. Sarma, M. Gerosa, and I Steinmacher, "Women's Participation in Open Source Software: A Survey of the Literature," arXiv:2105.08777 2021.

[2] OECD, *Bridging the Digital Gender Divide: Include, Upskill, Innovate*. OECD Publishing. https://doi.org/10.1787/9789264312826-en 2018.

[3] Nafus, D, "'Patches Don't Have Gender': What is Not Open in Open Source Software," New Media & Society, vol. 14, no. 4, pp. 669–683, 2012. https://doi.org/10.1177/1461444811422887.

[4] A. Capiluppi, and A Serebrenik, "Gender, representation and online participation: A quantitative study," Interacting with Computers, vol. 26, no. 5, pp. 488–511, 2014. https://doi.org/10.1093/iwc/iwu009.
[5] S. Cheryan, A. Master, and A. N Meltzoff, "Cultural stereotypes as barriers to gender equality in computer science," Psychology of Women Quarterly, vol. 39, no. 1, pp. 131–136, 2015. https://doi.org/10.1177/0361684314552651.
[6] UNESCO, *Cracking the Code: Girls' and Women's Education in STEM*. United Nations Educational, Scientific and Cultural Organization. 2020.
[7] R. Fletcher, and M Thompson, "Women in tech: A literature review on barriers and success stories," Science and Technology, vol. 11, no. 2, pp. 179–192, 2019.
[8] World Bank. (2022). Digital Skills for a Digital Economy: Challenges and Best Practices.
[9] UN Women, "Gender Equality and Women's Empowerment in the Digital Age," United Nations Women. 2019.
[10] Barker, H, "Empowering women in tech: A review of the literature," Journal of Information Technology & Society, vol. 15, no. 3, pp. 99–112, 2018.
[11] L. M Guapi Guaman, "Empoderamiento de las mujeres en las Tecnologías de la Información y la Comunicación (TIC), Latacunga-Ecuador," Revista Científica UTecnologías de la Información y la Comunicación (TIC), vol. 11, no. 1, pp. 904–920, 2024.
[12] AmeriCorps, "Volunteering as a Pathway to Employment," 2013. [Online]. Available: https://www.americorps.gov/sites/default/files/evidenceexchange/FR_2013_VolunteeringasaPathwaytoEmployment_1.pdf.
[13] Make WordPress Community, "Guía para crear comunidades inclusivas en WordPress," 2024. [Online]. Available: https://make.wordpress.org/community.
[15] B. J Zimmerman, "Self-efficacy: An essential motive to learn," Contemporary Educational Psychology, vol. 25, no. 1, pp. 82–91, 2000. https://doi.org/10.1006/ceps.1999.1016.
[16] B. Trinkenreich, I. Steinmacher, and M. A Gerosa, "Open source and inclusion: Addressing the needs of newcomers in software projects," Empirical Software Engineering, vol. 27, Art. no. 92, 2022. https://doi.org/10.1007/s10664-022-10105-2.
[17] D. Ford, J. Smith, P. J. Guo, and C Parnin, "Paradise Unplugged: Identifying Barriers for Female Participation on Stack Overflow," in Proceedings of the 24th ACM SIGSOFT International Symposium on Foundations of Software Engineering, 846–857. 2016. doi:10.1145/2950290.2950331.
[18] A. Master, S. Cheryan, and A. N Meltzoff, "Computing whether she belongs: Stereotypes undermine girls' interest and sense of belonging in computer science," Journal of Educational Psychology, vol. 108, no. 3, pp. 424–437, 2016. doi:10.1037/edu0000061.
[19] S. Graham, and A Searle, "Strategies for building women's confidence in STEM," International Journal of STEM Education, vol. 7, no. 1, pp. 42, 2020.
[20] Make WordPress Community, "Women in WordPress: A Recap of Our International Women's Day Events," 2025. [Online]. Available: https://make.wordpress.org/community/2025/05/14/women-in-wordpress-a-recap-of-our-international-womens-day-wordpress-events/.
[21] Make WordPress Community, "Historias de impacto: Mujeres liderando en WordPress," 2024. [Online]. Available: https://make.wordpress.org/community.
[22] V. Braun, and V Clarke, "Using thematic analysis in psychology," Qualitative Research in Psychology, vol. 3, no. 2, pp. 77–101, 2006. doi:10.1191/1478088706qp063oa.
[23] Wenger, E, *Communities of Practice: Learning, Meaning, and Identity*. Cambridge University Press. 1998.
[24] J. S Coleman, "Social capital in the creation of human capital," American Journal of Sociology, 94, S95–S120. 1988. doi:10.1086/228943.
[25] Bandura, A, "Self-efficacy: The Exercise of Control," W. H. Freeman. 1997.
[26] ATLAS.ti (versión 23). Qualitative Data Analysis Software [Software]. Scientific Software Development GmbH. https://atlasti.com.