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"If you want something said, ask a man, if you want something done, ask a woman."
Margaret Thatcher

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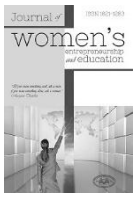

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In April 2020, JWEE was accepted for Scopus coverage, Elsevier.

JWEE is involved in the Peer Reviewed Journals List by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia

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Note of Editor-in-Chief

We will continue working diligently on enhancing **Journal Women's Entrepreneurship and Education** *(JWEE)*, with many exciting developments planned for 2026. My vision is to elevate JWEE to the next level of academic excellence, ensuring that it keeps pace with the rapidly evolving and dynamic fields of entrepreneurship and business resilience. These domains are continuously shaped by global economic shifts, technological innovation, and the increasing need for adaptability in uncertain environments.

In this context, I aim to act as a catalyst and facilitator—introducing the latest trends, emerging challenges, and new opportunities for research and collaboration. Our goal is to make JWEE a vibrant platform for scholarly exchange, where diverse perspectives intersect and where rigorous, impactful studies can inform both theory and practice.

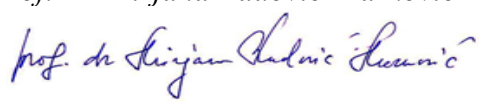
I am confident that there remains significant potential to strengthen JWEE's visibility and international reputation. We will seek to attract a broader readership and a new generation of contributors whose research integrates entrepreneurship with related disciplines such as economics, technology, innovation management, decision sciences, psychology, leadership, organizational behavior, and the social and behavioral sciences. By encouraging interdisciplinary dialogue, we aim to enrich understanding and promote resilience in today's complex business environments.

Finally, I kindly ask all authors to carefully follow the journal's technical instructions when preparing their manuscripts. I also invite you to share information about JWEE within your professional networks and to encourage your most accomplished colleagues to submit their high-quality research. Together, we can further enhance the academic and societal impact of the **Journal of Women's Entrepreneurship and Education.**

November 2025

Yours faithfully

Prof. Dr Mirjana Radovic-Markovic



Editor-in-Chief

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ORIGINAL SCIENTIFIC PAPER

A Qualitative Case Study on Issues of Women's Empowerment in Malaysia's Corporate Landscape

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A B S T R A C T

This qualitative case study investigates the systemic barriers hindering women's empowerment within Malaysian corporations. The research identifies systemic barriers impacting women's professional progress, access to leadership roles, and overall job satisfaction. Using a qualitative research methodology, the study captures diverse subjective experiences through in-depth interviews with professional women across various industries in Malaysia. Through thematic analysis, the findings highlight key issues such as cultural stereotypes, unequal pay, limited leadership representation, and work-life balance challenges. By uncovering the nuanced dynamics of these barriers, the study enhances understanding of workplace gender disparities. It provides actionable insights that can inform policies, corporate strategies, and academic research aimed at dismantling barriers to gender equality. These insights provide valuable

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perspectives for policymakers, corporate leaders, and scholars aiming to dismantle barriers to gender equality.

KEYWORDS: *gender equality, barriers to empowerment, women's empowerment, corporate challenges, leadership disparities, cultural stereotypes, Malaysia, inclusive workplace*

Introduction

Malaysia is an intriguing example of a nation striving to balance economic growth with gender equality. Despite being a signatory to the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 2022) and implementing the National Policy on Women, systemic challenges persist in its corporate landscape. These include unequal pay, limited access to leadership roles, and implicit cultural biases that hinder women's advancement (UN Women, 2022). The corporate environment remains challenging for women, with deep-seated cultural norms often dictating their roles at home and at work (Kapse et al., 2024). This results in a lack of equitable opportunities for women to reach their full professional potential. On top of that, the gender pay gap is a glaring issue, with Malaysian women earning 17% less than men compared to the global average of 16.2% (Komora, 2023). This wage disparity not only reflects unequal compensation but also contributes to broader systemic barriers, limiting women's career progression and access to leadership positions. As a result, underrepresentation in leadership roles persists, with women occupying only 24% of senior management positions despite making up a significant portion of the workforce (McKinsey & Company, 2022). Adding to these challenges are emerging trends such as the rise of freelance employment and the shifting dynamics of work-life balance, which disproportionately burden women due to the lack of job security, limited access to benefits like maternity leave and healthcare, and persistent societal expectations that place a greater share of caregiving responsibilities on them. As a result, women must juggle career aspirations with domestic duties, further limiting their opportunities for professional advancement (Kapse et al., 2024). These dynamics often exacerbate systemic inequities, leaving women at a disadvantage compared to their male counterparts (Talent Corporation Malaysia Berhad, 2023).

Addressing these challenges is essential for achieving Sustainable Development Goal 5 (SDG 5), which calls for gender equality and the

empowerment of all women and girls. Gender equality is not just a moral imperative but also a critical driver of economic growth, as reducing the gender gap in labor force participation could boost Malaysia's GDP by an estimated 22% through increased workforce participation, enhanced productivity, and greater innovation driven by a more diverse talent pool (OECD, 2023).

Problem Statement

Despite progress, Malaysia's corporate sector remains marked by significant gender inequalities. Women comprise only 24% of senior leadership positions, with even lower representation in technology and STEM sectors at 20% and 12%, respectively (McKinsey & Company, 2022). The underrepresentation of women in these high-growth industries limits their access to lucrative career opportunities, leadership pipelines, and decision-making roles, further exacerbating gender disparities in corporate advancement.

The 30% gender quota for leadership roles is a commendable policy, but it has yet to be fully realized. For example, women accounted for only 13.5% of Malaysia's 15th General Election candidates despite outnumbering men in voter registration (Zainal, 2022). This underrepresentation in politics mirrors broader systemic barriers that limit women's access to leadership roles across various sectors, including corporate governance, where gender quotas have yet to translate into equitable representation at senior levels. Biases, insufficient networks, and flawed decision-making processes exacerbate the undervaluation of women's talents, creating a talent drain that stifles innovation and economic growth. Globally, the gender pay gap costs $1 trillion annually, with Malaysia mirroring this trend as women earn 17% less than men (MAHAVERA, 2023).

Societal expectations further complicate matters, particularly for working mothers. The lack of affordable childcare and flexible work arrangements forces many women to choose between family and career, leading to significant workforce attrition. Closing this gap could increase Malaysia's GDP by 22%, driven by higher female workforce participation, improved productivity, and greater innovation across key sectors such as technology, finance, and healthcare (Talent Corporation Malaysia Berhad, 2023).

Additionally, deep-seated stereotypes and biases continue to pervade workplace culture, often limiting women's advancement opportunities despite policies aimed at promoting equality (UN Women, 2022). Gaps in implementing initiatives like the 30% quota further hinder meaningful progress, necessitating systemic reforms such as stricter policy enforcement, workplace inclusivity programs, and mentorship initiatives to support women's career advancement (McKinsey & Company, 2022).

Addressing these challenges requires dismantling barriers and creating inclusive environments that allow women to realize their full potential, contributing to a more equitable and innovative corporate landscape.

Research Objectives

This qualitative case study aims to explore the challenges faced by women in Malaysia's corporate sector. It will examine how barriers to leadership roles, wage inequality, and work-life balance are interconnected and reinforce one another. It will analyze how cultural, societal, and economic factors perpetuate gender biases, hindering women's career progression (UN Women, 2022). Additionally, the study will evaluate the effectiveness of existing strategies, from government policies to organizational practices, using criteria such as policy implementation rates, corporate adoption levels, and measurable outcomes for women's workforce participation and career progression. It will identify areas for improvement and actionable steps to enhance women's professional growth (McKinsey & Company, 2022).

Through narratives collected from women across industries, the research will provide insights into the real-world obstacles they face, offering a comprehensive understanding of gaps in support and opportunities for advancement (Talent Corporation Malaysia Berhad, 2023).

Significance of Study

This study highlights the moral and economic imperatives of closing the gender gap in Malaysia's corporate sector. Gender equality promotes social justice and enhances creativity, profitability, and innovation, with increased female leadership positively correlating with organizational performance (OECD, 2023). The research underscores systemic obstacles such as the gender pay gap, underrepresentation in leadership, and cultural stereotypes, while revealing pathways for addressing these disparities. By

examining lived experiences, this study contributes to a deeper understanding of Malaysia's unique challenges, particularly in addressing cultural stereotypes, workplace gender biases, and policy inefficiencies. These insights offer valuable lessons for similar developing countries with patriarchal corporate structures, wage disparities, and underrepresentation of women in leadership (UNESCO, 2023). Scholarly contributions include providing a theoretical framework for understanding gender biases and actionable recommendations for stakeholders, policymakers, and corporations. The study's findings aim to inspire structural changes that foster a more inclusive and equitable corporate landscape in Malaysia and beyond.

Literature Review

Empowering women in the workforce contributes positively to overall economic growth at all levels: individual, family and nation (Bhandari et al., 2024). Much research has focused on how psychological and structural empowerment affects business success. The complexity of women's empowerment in the corporate sector has drawn the attention of scholars and policymakers globally. In Malaysia, literature explores how societal norms and economic modernization challenge women's advancement in corporate leadership. Research from the Fourth World Conference on Women in Beijing (1995) laid the groundwork for addressing gender disparities, emphasizing the need for structural interventions to dismantle barriers limiting women's participation in decision-making. Since then, studies have evolved from highlighting gender inequities to focusing on systemic factors that sustain them. The COVID-19 pandemic further exposed vulnerabilities in existing frameworks, emphasizing the need for sustainable policies that promote gender equality in corporate settings (Kabeer et al., 2021). Empirical research has revealed that despite policy interventions, such as the 30% quota for women on corporate boards, substantive gender parity remains elusive due to the persistence of implicit biases and workplace discrimination (OECD, 2023).

Theoretical perspectives offer critical insights into the mechanisms that enable or obstruct women's empowerment. Naila Kabeer's conceptualization of empowerment as a process involving resources, agency, and achievements underscores the necessity of dismantling patriarchal structures that limit women's career mobility (Kabeer et al.,

2021). Amartya Sen's capability approach highlights how empowerment should be assessed based on women's ability to achieve valued life outcomes despite socio-economic constraints (Chandra, 2024). Martha Nussbaum refines this approach by identifying key capabilities such as bodily integrity, imagination, and emotional attachment, which are essential for achieving genuine empowerment. Empirical studies reinforce these theories. Kamila's (2025) research reveals that economic participation alone does not guarantee empowerment unless accompanied by structural reforms to eliminate workplace discrimination. Retno Wulandari and Ahmad's (2025) study on Malaysian corporate leadership highlights that despite increased female workforce participation, deeply ingrained biases restrict women's access to executive roles. Additionally, recent studies (Russell, 2022; Ferdous et al., 2023) critique the enforcement of gender quotas, arguing that these policies often result in token representation rather than actual shifts in corporate leadership dynamics.

A summary of key scholars and their contributions to the discourse on women's empowerment is provided below:

Table 1: Summary of Scholarly Approaches to Women's Empowerment

Scholar	Main Concepts	Approach to Women's Empowerment
Naila Kabeer	Resources, Agency, Achievements	Identifies systemic barriers that prevent women from accessing resources, exercising agency, and achieving empowerment (Kabeer et al., 2021).
Amartya Sen	Capability Approach	Highlights the economic and social constraints limiting women's freedom to pursue valued lives (Chandra, 2024).
Martha Nussbaum	Central Capabilities	Critiques societal and legal structures that deny women essential capabilities for empowerment (Liu & Wang, 2024).
Michelle Bachelet	Political Empowerment	Points to systemic biases and limited representation of women in governance, which weaken democratic processes (Kamila, 2025).
Gita Sen and Caren Grown	Global and Intersectional Analysis	Examines how structural inequalities exacerbate disempowerment, particularly for marginalized women (Shaikh, 2024).

Sources: Synthesized by author based on Kabeer et al. (2021); Chandra (2024); Liu & Wang (2024); Kamila (2025); Shaikh (2024).

The barriers to women's empowerment in Malaysia's corporate sector are multifaceted. Cultural and societal norms remain significant impediments, with entrenched gender stereotypes dictating women's roles both in the workplace and at home. The study by Galizzi et al. (2023) indicates that professional ambitions often clash with domestic expectations, reinforcing gendered divisions of labor. This is further supported by Zhang et al. (2024), who emphasize the need for cultural evolution to facilitate gender equality. Socio-economic disparities exacerbate these challenges, particularly in STEM fields where women remain significantly underrepresented. A study by Moorthy et al. (2022) reports that only 6–7% of women enrolled in engineering and technology programs compared to 20–21% of men, highlighting persistent stereotypes that dissuade women from entering male-dominated industries. Fernández et al. (2021) and Bhandari et al. (2024) further note that women perform an overwhelming share of unpaid care work globally, limiting their capacity to participate fully in the workforce and ascend to leadership positions.

Despite Malaysia's commitment to gender equality through policy measures, significant gaps remain in enforcement and corporate accountability. Research by Barbar et al. (2023) highlights the inadequacy of existing maternity leave policies, childcare support, and workplace harassment protections. The glass ceiling effect, compounded by implicit biases embedded in corporate cultures, continues to obstruct women's career progression despite formal equal opportunity policies. Empirical evidence from Galsanjigmed and Sekiguchi (2023) indicates that leadership structures remain predominantly male-dominated, with limited mentorship and sponsorship opportunities for women aspiring to senior management roles.

Feminist theory provides a critical lens for analyzing the systemic barriers hindering women's empowerment in corporate Malaysia. Liberal feminism critiques policy shortcomings, arguing that legal reforms such as Malaysia's 30% board quota must be strengthened with meaningful enforcement mechanisms to ensure substantive change (Zainal Abidin et al., 2024). Socialist feminism links economic dependency to gender inequity, advocating for policies such as subsidized childcare and flexible work arrangements to support working women. Radical feminism examines patriarchal corporate cultures, calling for fundamentally re-evaluating leadership norms to challenge implicit biases that sustain male dominance (Lydia Majela, 2024). Intersectional feminism highlights the compounded discrimination faced by women due to overlapping identities, such as

ethnicity and socio-economic status, which create unique barriers to corporate advancement. Muhamad et al. (2023) emphasize that a singular approach to gender equality is insufficient, advocating for multi-dimensional strategies that address women's diverse challenges within corporate environments.

Comparative insights into ASEAN countries further illuminate Malaysia's gender equity challenges. In Singapore, gender diversity hiring mandates and flexible work arrangements have significantly improved women's leadership representation (Lee, 2024). Thailand has implemented gender equity targets and leadership mentorship programs, yielding higher participation rates of women in senior corporate roles (The World Bank Group, 2024). Research suggests that structured mentorship programs and comprehensive gender-sensitive corporate policies have fostered inclusivity in these countries. Indonesia has empowerment program efforts carried out by the government to assist women entrepreneurs in facing the challenges of building a business (Sugiyanto et al., 2024). By contrast, Malaysia's approach has been hindered by limited policy enforcement, a lack of corporate incentives, and deep-seated cultural biases that continue to restrict women's advancement (Moorthy et al., 2022). This comparative analysis highlights policy gaps and underscores the need for evidence-based interventions prioritizing workplace inclusivity and long-term structural reforms.

While existing literature provides valuable insights into the challenges of women's empowerment, research gaps remain, particularly in evaluating the long-term impact of policy interventions on gender parity in corporate leadership. Comparative studies assessing the effectiveness of global best practices in the Malaysian corporate sector are necessary to identify scalable solutions. Further research should explore how intersectional factors influence women's career trajectories, particularly in industries where gender disparities are most pronounced. Addressing the challenges of cultural bias, socio-economic constraints, and policy inefficiencies requires a multi-pronged approach integrating legal reforms, corporate restructuring, and educational initiatives (Moorthy et al., 2022). This study aims to contribute to a more profound, evidence-based discourse on women's empowerment, aligning with the journal's scholarly standards and academic expectations by synthesizing theoretical perspectives with empirical findings.

Methodology

This qualitative case study employs a constructivist and phenomenological approach to examine the systemic barriers to women's empowerment in Malaysia's corporate sector. By focusing on the lived experiences of professional women, this research aims to understand how cultural, socio-economic, and organizational structures contribute to gender inequalities. The constructivist paradigm allows for interpreting gender disparities through subjective experiences, while phenomenology ensures an in-depth exploration of individual perceptions and institutional constraints (Tirka Widanti, 2023). The combination of these approaches is particularly relevant to investigating gendered career trajectories in male-dominated industries and analyzing how social structures shape professional outcomes for women.

Participants were selected through purposive sampling to include women from underrepresen3ted industries such as technology, finance, and engineering. These sectors were deliberately chosen because they represent male-dominated environments where structural obstacles to women's career and professional growth are more pronounced. Recruitment was conducted through multiple channels, including professional networks, industry associations, corporate diversity initiatives, and targeted outreach via LinkedIn and organizational partnerships. This approach ensured diverse perspectives, capturing insights from women at various career stages, from entry-level positions to senior management (Ashraf et al., 2023). The study prioritized perspectives from women directly impacted by gender-focused policies or corporate initiatives, enabling a nuanced understanding of systemic barriers (Tirka Widanti, 2023). The sample size was determined by data saturation, ensuring a comprehensive exploration of recurring themes and patterns.

Data collection involved semi-structured interviews, allowing participants to discuss their experiences openly, yet guided while ensuring key themes are addressed (Hsu et al., 2024). This method provided flexibility, allowing participants to elaborate on their challenges, perceptions of corporate policies, and personal career trajectories. Interviews were conducted in person and virtually, depending on participant availability and preferences, ensuring a comfortable discussion environment. Each interview lasted between 45 and 90 minutes and was audio-recorded with consent for accurate transcription. Document analysis was also used as a supplementary

data source rather than as an equally weighted method. Industry reports, corporate gender policies, and academic literature were reviewed to contextualize participant experiences within broader institutional frameworks (Hsu et al., 2024). This data triangulation helped strengthen the study's validity by providing an institutional context to personal narratives.

Data analysis followed a phenomenological approach, focusing on participants lived experiences within their socio-cultural and professional environments. The analysis process began with multiple readings of interview transcripts and document analysis findings to identify emerging themes. Manual coding was conducted without software such as NVivo or ATLAS.ti, ensuring a deep and direct engagement with the data. Thematic analysis was performed through an iterative process, where meaning units were manually categorized, compared, and refined. Key themes – such as career progression barriers, workplace policies, cultural stereotypes, and organizational bias—were identified and synthesized into a cohesive narrative aligning with SDG 5's objective of eliminating gender inequalities in professional settings (United Nations, 2022). To ensure rigor, peer debriefing sessions were conducted where coded data was cross-checked with research collaborators to reduce subjectivity.

This study acknowledges several methodological limitations. The phenomenological approach relies on subjective interpretations of lived experiences, making researchers bias a potential concern. To mitigate this, reflexivity was actively practiced through memo-writing and ongoing self-evaluation, ensuring that personal biases did not influence data interpretation (Dodgson, 2023). The reliance on self-reported experiences presents another challenge, as participants may filter or frame their responses based on social desirability. Findings from this study are specific to Malaysia's corporate sector and may not be generalizable to other national contexts due to unique socio-economic and cultural settings (Ahmad et al., 2023). However, insights from this research contribute to the broader discourse on gender inclusivity in professional environments.

Additionally, purposive sampling, while allowing in-depth exploration, has inherent limitations in diversity. To address this, participants were intentionally selected from various organizational levels, company sizes, and industry sectors to enhance representativeness. While the findings are not meant to be statistically generalizable, they offer valuable qualitative insights into gender barriers in Malaysia's corporate landscape.

By integrating research design, participant selection, data collection, data analysis, and study limitations into a unified narrative, this methodology ensures a clear and cohesive presentation of the research process in line with the journal's expectations. This structure enhances conceptual clarity and methodological transparency, strengthening the study's alignment with academic standards in qualitative research.

Research Design

The study employs a phenomenological framework, emphasizing subjective experiences and socially constructed realities (Hsu et al., 2024). This approach is particularly relevant to understanding women's barriers to leadership and workplace empowerment. Using semi-structured interviews as the primary data collection method, supported by corporate policy reviews and industry reports, this design ensures a comprehensive understanding of systemic inequalities (Hsu et al., 2024). Nevertheless, semi-structured interviews are well-suited to the phenomenological approach due to their flexibility in exploring individual experiences while ensuring that key themes are addressed. Phenomenology’s focus on lived experiences allows the study to highlight specific challenges, such as navigating corporate cultures shaped by traditional norms and balancing professional aspirations with societal expectations (Zhang et al., 2024).

Ethical Considerations

Written consent will be obtained, and copies will be given to participants for their records. This guarantees voluntary involvement and is consistent with ethical norms. Confidentiality will be maintained by storing identifiable information securely and restricting access to the research team. Pseudonyms will be used in publications to protect anonymity. Encryption and secure servers will safeguard electronic data, while physical documents will be stored securely (Singh & Engel-Hills, 2022). Given the sensitivity of topics like discrimination and workplace barriers, the researcher will handle interviews with care and respect. Participants will be offered support services if distress arises during discussions, ensuring their well-being is prioritized.

Findings and Discussion

The findings of this study are categorized under four key themes that emerged through thematic analysis:

1. Challenges of Women's Empowerment in Corporate Sectors
2. Main Barriers Preventing Women from Advancing
3. Work-Life Balance Struggles
4. Organizational and Policy Gaps

Theme 1: Challenges of Women's Empowerment in Corporate Sectors

A recurring challenge among participants was the bias in promotions, where male colleagues were frequently prioritized for advancement despite having similar or less experience. Women were often perceived as less capable of holding senior positions due to traditional gender norms associating leadership with masculinity.

"I worked for three years while my male colleague worked for two, yet he was promoted ahead of me."

This reflects systemic biases in promotion policies, which favor men over equally or more qualified female employees. Additionally, stereotypes regarding emotionality and leadership further limited women's opportunities for career progression. Many participants reported being perceived as "too emotional" to take on executive roles, reinforcing the belief that men are better suited for decision-making positions.

"Maybe they think I am too emotional for leadership roles."

Furthermore, proving competence remains an uphill battle for women seeking leadership roles. Many participants felt they had to work significantly harder than their male counterparts to be considered for promotions.

"A woman that wants to go up to a managerial level has to prove herself before she can get into a leadership position."

These findings align with prior research highlighting the persistence of gendered perceptions of leadership competency in corporate environments (Zhang et al., 2024).

Theme 2: Main Barriers Preventing Women from Advancing

Participants frequently cited economic disparities, particularly unequal pay and biased promotion practices, as barriers to career progression. Many expressed frustration over gender pay gaps, which negatively impact career motivation and financial security.

"Men get the higher pay than women just because they have bigger responsibilities in caring for the family."

Malaysia has introduced gender pay equity initiatives, yet the lack of salary transparency and collective bargaining mechanisms reduces their effectiveness. Studies suggest that companies with transparent salary structures experience reduced pay disparities, yet Malaysia has not mandated these policies nationally (United Nations, 2022).

Biased promotion practices also emerged as a significant challenge. Women were often overlooked for leadership roles due to perceptions of their "lack of leadership skills," reinforcing traditional stereotypes that men are natural leaders.

"Women often get passed on if there is any promotion because of their perceived lack of leadership skills."

Additionally, participants highlighted the impact of traditional gender roles and maternity leave policies. Some organizations view maternity leave as a loss, further discouraging the promotion of women to leadership positions.

"Companies consider maternity leave a loss because a person in a leadership role is absent for three months."

These findings emphasize the need for corporate reforms to ensure equitable hiring and promotion policies.

Theme 3: Work-Life Balance Struggles

Work-life balance remains a significant challenge, particularly for women in demanding professional roles. Long working hours and high workloads contribute to stress and burnout, negatively affecting career progression and personal well-being.

"High workloads and limited time contribute to stress and burnout."

This issue is particularly evident in academia and high-pressure corporate settings, where female professionals must balance multiple responsibilities, including caregiving roles.

"Managing research and teaching simultaneously leaves little time for personal life."

Women also highlighted gender-based workload distribution, where men and women are often assigned different responsibilities based on societal expectations.

"If you are a man, you are given different weightage, and if you are a woman, there is a difference in the responsibilities given."

"If you are a mother, you do not have much time for yourself because you have to take care of your kids and your husband, cook, and clean."

Studies from Singapore and Thailand indicate that implementing paid parental leave and hybrid work options significantly improves work-life balance, yet Malaysia's corporate sector has been slow to adopt these measures (Zhang et al., 2024). These findings underscore the need for workplace policies prioritizing flexibility to support female professionals.

Theme 4: Organizational and Policy Gaps

Several participants reported that weak enforcement of gender equality policies and inadequate maternity leave regulations restricted women's workforce participation.

"The lack of proper maternity leave and childcare options makes it hard to focus on my career after having children."

The absence of affordable childcare support forces many women to either take extended career breaks or leave the workforce entirely, affecting long-term career progression (Tirka Widanti, 2023). Workplace harassment remains a concern, as existing protective policies are often poorly enforced.

"Women do not know if they could tell their bosses or HR if they are harassed due to the lack of trust in words."

Participants also highlighted the glass ceiling effect, where women struggle to reach executive roles despite having equal or superior qualifications.

"Despite my qualifications and performance, I feel like there is an invisible barrier preventing me from advancing to senior roles."

Although some diversity and inclusion initiatives exist in Malaysia, many remain tokenistic rather than structural, with limited enforcement mechanisms. This highlights the urgent need for policy interventions, such as stronger employment protections, gender-inclusive hiring, and equitable leadership representation.

Aligning with SDG 5's goal of fostering inclusive decision-making, organizations must take concrete steps to address gender disparities in the workplace (McKinsey & Company, 2022).

Conclusion

The study identifies multiple challenges hindering women's empowerment in Malaysia's corporate sector, emphasizing how cultural norms, organizational biases, and weak policy enforcement create barriers to career advancement. Deep-rooted gender stereotypes and societal expectations remain significant obstacles, where women are often expected to prioritize domestic responsibilities over professional aspirations (Tirka Widanti, 2023). These ingrained norms contribute to the underrepresentation of women in leadership roles and slow the progression toward gender equality in the workforce.

Corporate and policy interventions must be implemented to address these challenges. Effective strategies include leadership development programs, mentorship initiatives, transparent salary structures, and stricter enforcement of anti-discrimination policies (Retno Wulandari & Ahmad, 2025). These measures can help bridge the gender gap in career advancement and foster equitable workplace environments.

To dismantle long-standing biases, a cultural shift within organizations is also necessary. Companies should implement unconscious bias training, diversity hiring initiatives, and flexible work arrangements to create a more inclusive corporate culture (OECD, 2023). Encouraging women's participation in leadership requires a collective effort from policymakers, corporate leaders, and society.

Future research should explore these challenges on a larger scale by conducting quantitative studies to validate the qualitative themes identified. Comparative research in other Southeast Asian countries could also provide broader regional insights into gender disparities in corporate environments. Expanding the research scope would enhance understanding the structural

and cultural factors affecting women's career progression, contributing to more targeted and effective policy recommendations.

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ORIGINAL SCIENTIFIC PAPER

The Role of Artificial Intelligence in Empowering Women Entrepreneurs in the United Arab Emirates

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A B S T R A C T

In the recent era, artificial intelligence has entered the business sector by increasing business productivity, decision-making, and competitive advantage in markets for entrepreneurs. This is why the use of AI is a corresponding aspect of business activities across the globe. The study investigates the role of AI in supporting Emirati women entrepreneurs using mixed-method research. This approach allows research instruments like survey questionnaires and interviews to gain quantitative and qualitative insights. Using the convenience sampling procedure, quantitative data were gathered from 207 respondents, and interviews were conducted and analyses using descriptive and inferential statistics. The findings indicate that AI-powered automation enhances the effectiveness of operations, minimises bureaucracy, and fosters evidence-based decision-making. In addition, AI opens access to funding by simplifying credit analysis and investment prospects, thus eliminating conventional financing hurdles. AI-based learning solutions also enhance skills, giving women entrepreneurs the skills to manoeuvre flexible business environments. Moreover, AI-based market analytics delivers richer customer insights, allowing customized services and business

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growth. Despite these benefits, data privacy and technology adoption issues are still pertinent. The research finds that AI is a game-changing facilitator for women entrepreneurs, enabling business scale and limiting gender-based hindrances in entrepreneurship. The study's policy implications underscore the imperative for inclusive AI adoption policy, focused training programs, and facilitating policies to achieve the fullest possible potential for AI in catalysing women's business success.

KEYWORDS: *artificial intelligence, women entrepreneurs, business efficiency, market analytics, financial inclusion, AI-driven learning*

Introduction

The United Arab Emirates (UAE) is one of the few countries in the region where women are actively participating in entrepreneurship and where 45% of small and medium-sized enterprises (SMEs) are run by women, as illustrated in Figure 1 (Johnson, 2024). However, a troubling proportion of these are micro-businesses, with 88% falling under that category. The challenge arises when trying to transition these micro-enterprises into the retail realm that extends beyond the borders of the nation, which involves issues such as financing and regional or global market entry (Awad et al., 2024; Alnuaimi & Tabbara, 2023).

To aid such advancements, the UAE government has greatly emphasized the role of AI in the technology sector for women by launching various initiatives. One such example is the National Program for Coders, which facilitates opportunities to learn in various fields through programs like "AI-Forward," where 100 Emirati women are trained in AI skills, including but not limited to cybersecurity (Dark Reading, 2024). Even with all these initiatives, the lack of adoption of AI by UAE women entrepreneurs is primarily caused by financial constraints, lack of adequate awareness, and deeply rooted cultural norms (Hassan, 2024). The application of AI in business management is a well-studied area. However, there is scant literature concerning its adoption by women entrepreneurs in the UAE, a region with a very particular socio-cultural and economic setting. Even though the UAE has experienced an increase in female entrepreneurs in recent years, a few barriers, such as financing, work-life balance, and gender prejudices, persist (Basheer, 2023).

This study will help fill this gap by examining the intersection of AI and women's entrepreneurship to understand how technology can help tackle these issues and improve women entrepreneurs' well-being and

business success. Applying AI technologies to decision-making, business productivity, and work-life management greatly assists in closing the gap senior women entrepreneurs face (Abadzi & ElAsad, 2021). Considering its scope, this study furthers the discourse on how modern tech can lessen the gaps exhibited in entrepreneurial activities amongst women. This research will undoubtedly reveal mechanisms through which women can scale traditional boundaries imposed on them using AI tools, which optimally set the business environment. Moreover, the research should be accompanied by the development training material and support systems that enable women to harness AI effectively in their enterprises (Alateeg & Al-Ayed, 2024).

Given the broad scope of the study, it aims to explore and understand the role of Artificial Intelligence (AI) in empowering women entrepreneurs in the UAE. To achieve its research aim and objectives, the study employs mixed-method research to assess the adoption and effectively evaluate AI's influence on business growth and financial access for women entrepreneurs in the UAE. In this regard, the study has been designed to address the following specific research questions.

- How do UAE women entrepreneurs perceive the role of AI in improving decision-making and business efficiency?
- What impact does AI have on the work-life balance of women entrepreneurs in the UAE?
- In what ways does AI contribute to the growth and financial success of women-led businesses in the UAE?

Theoretical Framework

Many studies included in this review are built on established theories that segregate the adoption and impact of AI on women entrepreneurs. 'Innovation Diffusion Theory,' Rogers pioneered, is integral for most studies and the core framework. The idea focuses on the spread and adoption of new technologies across society. It can also be seen in the study by Anabtawi et al. (2024) on generative AI tools for women entrepreneurs. Moreover, one structure often cited in the context of cultural stereotypes and societal attitudes toward women's entrepreneurial endeavours is the Socio-cultural Theory. Alateeg and Al-Ayed (2024) elaborate on the stereotype's women entrepreneurs face in Saudi Arabia, specifically emphasizing AI.

The authors look at women's activism in business in Saudi Arabia and how AI affects their operations.

The study's findings, which are based on 16 elaborate interviews with women entrepreneurs, include challenges of low familiarity with the AI tools available, poverty, and cultural constraints. In the context of the UAE, Abed (2024) examines women's athletic performance and sustainability in the region using AI technologies. Mehrunissa et al. (2024) included data from a 385 U AE female athletes survey. The study shows that AI can improve athletic performance through practical training, injury monitoring, and prevention plans. The inquiry further explores the issues of the nexus between gender empowerment and ecological sustainability, depicting AI as an innovative tool capable of improving women's athletic performance while decreasing the ecological footprint of the sport. Mahmood et al. (2023) look into the impact of organizational culture and AI-related education on women's leadership achievement in the UAE. They used structured questionnaires targeting women leaders in the region to identify organizational culture and AI training as success contributors. The study demonstrates that AI technologies support women in leadership roles by enabling more effective data-based decision-making and improving technical proficiency.

This study is important in overcoming leadership challenges and improving organizational results using technology resources such as AI. Stimulated by the context of generative AI instruments, Anabtawi et al. (2024) analyse women business owners' acceptance of such technologies and mention factors like trialability and observability that facilitate adopting these instruments.

The other school of thought reinforces related dimensions of technological adoption. For instance, Shamaki et al. (2022) argued that there must be a good balance between adopting technology and its broader implementation for businesses. Feranita et al. (2024) added that human, financial, physical, and intellectual resources positively and significantly impact female entrepreneurs' adoption of digital technology. Henceforth, the role of these determinants cannot be overlooked.

The mediated assessment of leadership by Tejada and Cumino (2024) pointed out that psychological factors such as work stress are critical determinants of business success for both men and women. Therefore, the conceptualization of women's entrepreneurship must be well-aligned with social, psychological, and cultural variables. Lastly, Karali et al. (2024)

assessed high-profile women executives and concluded that organizations with technological innovation stimulate creative thinking, leading to higher performance rates.

The discussion provides substantial conceptual information for evaluating the role of technology and AI in empowering women at the individual, social, cultural, organizational, and economic levels.

Methods and Materials

This research uses a mixed-methods design that integrates exploratory qualitative and descriptive quantitative research approaches to investigate the role of AI in enabling women entrepreneurs in the United Arab Emirates. The research design explores the lived experiences and general patterns of AI adoption, decision-making, business performance, and work-life balance. The qualitative part concerns the lived experiences of women entrepreneurs and the perceived effect of AI on their entrepreneurial experience. This stage employed semi-structured interviews with ten women entrepreneurs across different industries. Although non-probabilistic, participants were chosen using convenience sampling, which is appropriate for exploratory research where accessibility and willingness to participate are crucial (Rahman et al., 2022). Interviews were audio-recorded, transcribed, and analysed through thematic analysis, adhering to the steps detailed by Dhakal (2022) and Reñosa et al. (2021). These steps included recognizing recurring patterns, significant themes, and latent constructs describing how AI technologies shape women's entrepreneurial activities. NVivo software facilitates systematic and rigorous coding (Duan et al., 2019; Rahman et al., 2022). Quantitative components seek to establish overall patterns and correlations between the selected variables.

This study examines a range of constructs associated with AI adoption and its influence on entrepreneurial outcomes, particularly for women. Decision-Making (DEM) refers to the enhancement of strategic, financial, and operational choices through AI-powered real-time insights, as highlighted by Samara et al. (2024) and Kaggwa et al. (2024). Work-life balance (WLB) is supported by AI tools that assist in managing time and reducing stress, facilitating equilibrium between professional and personal responsibilities (Agarwal & Goel, 2024). Business Automation (BAU) encompasses using AI to streamline repetitive tasks, thereby boosting efficiency and enabling focus on strategic planning (Aiswarya & Sangeetha,

2023). Financial Access (FIA) reflects improved access to credit, loans, and investment opportunities through AI-based fintech solutions, reducing traditional barriers (Khoza, 2024). The role of Skill Development and Learning (SDL) is emphasized through AI-powered educational platforms that foster continuous entrepreneurial growth (Sanni, 2025). Networking and Collaboration (NWC) are enhanced via AI-driven systems that connect entrepreneurs with mentors and collaborators, fostering supportive business ecosystems (Seshasai & Shriya, 2024). Customer Engagement (CUE) benefits from AI tools like chatbots and analytics, which personalize interactions and improve customer retention (Usman et al., 2024). Risk Management (RMG) is strengthened through AI's capabilities in cybersecurity, fraud detection, and risk assessment (Bhatnagar & Yadav, 2023). These factors collectively influence Business Performance and Growth (BPG), which is driven by AI-enhanced decision-making and operational efficiency, ultimately reflecting improved profitability and sustainability (Alateeg & Al-Ayed, 2024; Welsh, 2018). At the core, the study focuses on Empowering Women Entrepreneurs (EWE) by leveraging AI to overcome structural and cultural barriers, fostering greater business autonomy and success (Thomas, 2025). For better understanding, a table has been added in the appendix (See Table A1 in the appendix). It is worth mentioning here that the items of the constructs have been assessed based on a 5-point likert scale that ranged from strongly disagree (coded as 1) to agree (coded as 5) strongly.

An organized online questionnaire was sent to UAE-based women entrepreneurs, and 207 finalized responses were obtained. The sample was once more drawn from convenience sampling, facilitating easy access to a varied pool of entrepreneurs actively using AI tools (Nii & Ogbewe, 2023). The questionnaire collected information on demographic variables, industry, entrepreneurial experience, and targeted AI applications. The study used frequency distribution for descriptive purposes and mediating regression analysis to investigate the relationships between independent (AI tools) and dependent (entrepreneurial performance indicators) variables (Nii & Ogbewe, 2023).

Results from both parts were triangulated to offer a holistic view of AI's role in women's entrepreneurship. All participants gave informed consent, and the research adhered to strict ethical guidelines, guaranteeing confidentiality and voluntariness. Table 1 provides a quick overview of the

demographic profile of the respondents who participated in the survey submissions.

Table 1: Summary of Demographic Profiles

Category	Frequency	Percentage (%)
Age Group		
18-24	15	7.2
25-34	11	5.3
35-44	36	17.4
45-54	103	49.8
55 or More	42	20.3
Level of Education		
Bachelor's Degree	39	18.8
Doctorate	1	0.5
Master's Degree	167	80.7
Industry of Business		
Catering	37	17.9
Coaching	45	21.7
Fashion	4	1.9
Finance	15	7.2
Healthcare	5	2.4
Marketing	14	6.8
Retail & E-commerce	66	31.9
Technology	2	1.0
Training	19	9.2
Years of Entrepreneurial Experience		
Less than 1 year	30	14.5
1-3 years	39	18.8
4-7 years	65	31.4
8+ years	73	35.3
Incorporating AI Tools in Business		
Yes	207	100.0

Source: Estimated by the authors

The demographic analysis in Table 1 provides key insights into the participants' profiles. According to the table, most respondents (49.8%) belong to the 45-54 age group, followed by those aged 55 or more (20.3%), indicating a significant presence of mid-career and experienced entrepreneurs. A substantial proportion (80.7%) hold a master's degree, suggesting a highly qualified sample. The business distribution sector

reveals that retail and e-commerce (31.9%) are the most prominent industries, followed by coaching (21.7%) and catering (17.9%), while technology (1.0%) and fashion (1.9%) are the least represented. Regarding entrepreneurial experience, most respondents (35.3%) have over eight years of experience, while 31.4% have between four and seven years. Notably, all participants (100%) have incorporated artificial intelligence (AI) tools in their businesses.

Results

Reliability Statistics

Table 2: Cronbach's Alpha Estimates

Overall Cronbach's Alpha	**Cronbach's Alpha Based on Standardized Items**	**N of Items**
.914	**.919**	**50**
Variables	Cronbach's Alpha	N of Items
DEM	0.840	5
WLB	0.843	5
BUA	0.880	5
FIA	0.929	5
SDL	0.781	5
NWC	0.606	5
CUE	0.803	5
RMG	0.950	5
BPG	0.943	5
EWE	0.804	5
Valid N (listwise)	207	

Source: Estimated by the Authors

Table 2 provides reliability statistics using Cronbach's alpha. According to the table, the coefficient's value is 0.914, indicating a high level of reliability of the scaled items (N=50). The overall Cronbach's Alpha for the 50-item scale is 0.914, indicating internal consistency. Most individual constructs show good reliability, such as FIA ($\alpha = 0.929$), RMG ($\alpha = 0.950$), and BPG ($\alpha = 0.943$). Constructs like DEM ($\alpha = 0.840$), EWE ($\alpha = 0.804$), and WLB ($\alpha = 0.843$) also demonstrate strong reliability.

However, SDL (α = 0.781) and NWC (α = 0.606) show relatively low reliability.

The correlation matrix in Table 3 presents the main factors influencing the empowerment of women entrepreneurs in the UAE, emphasizing AI's contribution. The correlation matrix reveals several statistically significant relationships among the variables at the 0.01 level. Strong positive correlations were found between FIA and EWE (r = .757) and between FIA and CUE (r = .663), indicating that better financial access is closely associated with increased empowerment and stronger customer engagement. DEM is also positively correlated with multiple variables, including FIA (r = .489), CUE (r = .494), and EWE (r = .424), suggesting its central role in enhancing other entrepreneurial capacities.

Table 3: Correlation Matrix

Var	DEM	WLB	BUA	FIA	SDL	NWC	CUE	RMG	BPG	EWE
DEM	1	.447**		.489**		.256**	.494**	.337**	.350**	.424**
WLB		1	.449**	.558**			.273**	.390**		.328**
BUA			1	.607**	.588**		.441**			.434**
FIA				1	.334**		.663**	.271**	.191**	.757**
SDL					1	.272**	.442**			.399**
NWC						1	.514**	.467**		
CUE							1	.532**		.416**
RMG								1	-.336**	
BPG									1	.386**
EWE										1

Source: Estimated by the Authors

Note: Only significant correlations at the 0.01 level are shown (p < 0.01, 2-tailed)

*** = very significant (p < 0.01)*

Similarly, BUA strongly correlates with FIA (r = .607) and SDL (r = .588), implying that automation is linked to improved finance access and skill enhancement. These findings collectively highlight that financial empowerment, decision-making abilities, and automation are key interconnected elements that contribute to the success and growth of women entrepreneurs.

Regression Analysis

Determining the Role of AI In Improving DEM and BPG

Table 4: Estimates of Model 1 (Predicting BPG as Mediator)

Predictor	Coefficient	SE	t	p	LLCI	ULCI
Constant	0	0.0523	0	1.0000	-0.1032	0.1032
DEM	0.4770	0.0736	6.484	0.0000	0.3319	0.6221
WLB	-0.2388	0.0795	-3.0036	0.0030	-0.3955	-0.0820
BUA	-0.1898	0.0925	-2.0507	0.0416	-0.3723	-0.0073
FIA	0.5072	0.0974	5.2070	0.0000	0.3151	0.6993
SDL	0.0527	0.0759	0.6947	0.4881	-0.0969	0.2023
NWC	0.1638	0.0739	2.2170	0.0278	0.0181	0.3096
CUE	-0.3362	0.1069	-3.1461	0.0019	-0.5469	-0.1255
RMG	-0.4127	0.0768	-5.3734	0.0000	-0.5642	-0.2613

Source: Estimated by the authors

Note: DEM = Decision-Making, WLB = Work-Life Balance, BUA = Business Automation, FIA = Financial Access, SDL = Skill Development and Learning, NWC = Networking and Collaboration, CUE = Customer Engagement, RMG = Risk Management, BPG = Business Performance and Growth, EWE = Empowering Women Entrepreneurs

The findings of Model 1in Table 4 show that DEM significantly and positively affects BPG with a coefficient value of 0.4770 ($p < 0.001$), indicating that effective decision-making increases organizational growth, which can affect employee work engagement. On the other hand, FIA ($\beta = 0.5072$, $p < 0.001$) is also significant, emphasizing the role of financial security at the organizational level. However, WLB, BUA, CUE, and RMG negatively correlate with BPG. The respective coefficients for the variables are -0.2388 ($p = 0.003$), -0.1898 ($p = 0.042$), -0.3362 ($p = 0.002$), and 0.4127 ($p < 0.001$). These findings unveiled that difficulty in balancing professional and personal life, business change adaptability, customer engagement, and role management might deter business growth. The results exhibit a positive correlation with BPG; the coefficient value is 0.1638 ($p = 0.028$), suggesting that improved networking and communication skills are linked to better organizational growth outcomes. Well-being. The model predicts 45.5% of the variance ($R^2 = 0.455$, $p < 0.001$) in BPG, showing a strong fit and supporting the important role of decision-making and access to finance in performance, which could further be strengthened using AI-

based decision-support systems and financial products for women entrepreneurs in the UAE.

Table 5: Estimates of Model 2 (Predicting EWE as outcome)

Predictor	Coefficient	SE	t	p	LLCI	ULCI
Constant	0	0.0355	0	1	-0.07	0.07
DEM	0.1182	0.055	2.1509	0.0327	0.0098	0.2266
BPG	0.1214	0.0482	2.5175	0.0126	0.0263	0.2165
WLB	-0.0881	0.0552	-1.5967	0.1119	-0.1968	0.0207
BUA	-0.1743	0.0635	-2.7471	0.0066	-0.2995	-0.0492
FIA	0.7844	0.0705	11.1296	0	0.6454	0.9234
SDL	0.3185	0.0515	6.1783	0	0.2168	0.4201
NWC	-0.2618	0.0508	-5.1577	0	-0.3619	-0.1617
CUE	-0.0033	0.0743	-0.0445	0.9645	-0.1498	0.1432
RMG	-0.1157	0.0558	-2.073	0.0395	-0.2257	-0.0056

Source: Estimated by the authors

The estimates of Model 2 have been explained in Table 5, incorporating the determinants of EWE. The model explicitly highlights decision-making DEM and BPG as main predictors. The model is firmly fitted ($R^2 = 0.7503$, $p < 0.001$) and explains 75.03% of EWE variance. FIA ($\beta = 0.7844$, $p < 0.001$) and SDL ($\beta = 0.3185$, $p < 0.001$) have the most significant positive influences, indicating that financial security and skill development play crucial roles in boosting women's entrepreneurship. DEM ($\beta = 0.1182$, $p = 0.033$) and BPG ($\beta = 0.1214$, $p = 0.013$) share positive significant correlations with EWE, suggesting that enhanced decision-making and organizational growth help to greater engagement. Nonetheless, BUA ($\beta = -0.1743$, $p = 0.007$), NWC ($\beta = -0.2618$, $p < 0.001$), and RMG ($\beta = -0.1157$, $p = 0.040$) are negative contributors to EWE, implying difficulties in adapting to business automation, networking, and risk management for women entrepreneurs in the UAE. The indirect impact of DEM on EWE via BPG ($\beta = 0.0579$, 95% CI: 0.0123–0.1186) again validates the mediating role of organisational growth.

Investigating the Impact of AI On WLB and RMG

The findings show that concerns related to WLB may adversely affect organizational performance. The coefficient value of -0.2388 ($p = 0.003$)

implies that balancing work and personal life could impede organizational performance. Additionally, a positive contribution of FIA and DEM can further be validated for organizations through respective positive coefficient values of 0.5072 ($p < 0.00$) and 0.477 ($p < 0.001$), highlighting the importance of financial security and sound decision-making in mitigating stress. In contrast, CUE ($\beta = -0.3362$, $p = 0.002$) and RMG ($\beta = -0.4127$, $p < 0.001$) are negative influences on BPG, indicating potential risk factors in dealing with customers and business duties.

Table 6: Summary of Key Findings

Effect Type	Effect	SE	t-value	p-value	LLCI	ULCI
Direct Effect (WLB → EWE)	-0.0881	0.0552	-1.5967	0.1119	-0.1968	0.0207
Indirect Effect (WLB → BPG → EWE)	-0.029	0.015	-	-	-0.061	-0.003
Direct Effect (DEM → EWE)	0.1182	0.055	2.1509	0.0327	0.0098	0.2266
Indirect Effect (DEM → BPG → EWE)	0.0579	0.0271	-	-	0.0123	0.1186

Source: Estimated by the authors

For EWE, BPG has shown a significant positive impact ($\beta = 0.1214$, $p = 0.013$), further affirming its mediating function. FIA has made strong positive contributions to EWE, which shows the value of AI-powered financial tools and ongoing learning systems. Nevertheless, BUA and NWC negatively impact engagement, perhaps from the stress of adjusting to change and over commitment expectations. The model accounts for 45.5% of BPG variance ($R^2 = 0.455$, $p < 0.001$) and 75.03% of EWE variance ($R^2 = 0.7503$, $p < 0.001$), indicating a good fit.

Evaluating the Impact of AI On BPG and FIA

The summary of key estimates in Tables 7 and 8 validates the impact of FIA on EWE, where BPG is the mediator. The results show that FIA ($\beta = 0.5072$, $p < 0.001$) positively impacts BPG significantly, such that organizational growth is improved substantially in a fair work environment. Moreover, DEM ($\beta = 0.477$, $p < 0.001$) and NWC ($\beta = 0.1638$, $p = 0.028$) have positive impacts on BPG. Nonetheless, the influence of factors such as

BUA (β = -0.1898, p = 0.042), CUE (β = -0.3362, p = 0.002), RMG (β = -0.4127, p < 0.001), and WLB (β = -0.2388, p = 0.003) on BPG is negative, implying that problems in these factors may inhibit the growth of organizations. The model accounts for 45.5% of the variance in BPG (R^2 = 0.455, F (8,198) = 20.6618, p < 0.001).

Table 7: Summary of Key Regression Results

Effect Type	Effect	SE	t	p-value	LLCI	ULCI
Direct Effect (FA → EWE)	0.7844	0.0705	11.13	0.000	0.6454	0.9234
Indirect Effect (FA → BPG → EWE)	0.0616	0.0272	—	—	0.0143	0.1221

Source: Estimated by the authors

In the prediction of EWE, FA (β = 0.7844, p < 0.001) is identified as the strongest predictor, reiterating that fairness directly influences work engagement. BPG (β = 0.1214, p = 0.013) also shows a positive influence, affirming its mediating role. Additionally, SDL (β = 0.3185, p < 0.001) positively affects EWE. In contrast, BUA (β = -0.1743, p = 0.007), NWC (β = -0.2618, p < 0.001), and RMG (β = -0.1157, p = 0.040) have adverse effects on engagement, suggesting possible stressors in conforming to change and coping with roles. The model accounts for 75% of the variance in EWE (R^2 = 0.7503, F (9,197) = 65.7727, p < 0.001).

Table 8: Model Fit and Bootstrap Analysis

Model 1 (Predicting BPG): R^2 = 0.455, F (8,198) = 20.6618, p < 0.001
Model 2 (Predicting EWE): R^2 = 0.7503, F (9,197) = 65.7727, p < 0.001
Bootstrap Samples: 5000
Confidence Level: 95%

Source: Estimated by the authors

In terms of mediation, FIA directly influences EWE (β = 0.7844, p < 0.001) strongly, and the indirect effect through BPG (β = 0.0616, 95% CI:

0.0143–0.1221) supports partial mediation. This suggests that fairness impacts work engagement and promotes growth.

Thematic Analysis of AI Adoption in Women-Led Businesses

Improved Efficiency and Productivity

The typical response among all participants was that AI had enhanced efficiency in their operations. AI-based automation software like Hub-spot, Calendly, Trendalytics, BlueCart, Epic Systems, and Thinkific have automated routine tasks, improved processes, and maximized resource use.

Useful AI Tools and Platforms

The following platforms were significant contributors to fulfilling women entrepreneurs' business needs. These tools enable entrepreneurs to automate critical business processes, saving time on administrative work.

- Coaching: HubSpot (CRM), Calendly (scheduling)
- Fashion: Trendalytics (trend prediction), Shopify AI (sales analytics)
- Catering: BlueCart, MarketMan (inventory management)
- Healthcare: Epic Systems (electronic health records), Zocdoc (scheduling)
- Training: Teachable, Thinkific (course management, student tracking)

Availability of Financial Resources and AI-powered learning and Skill Development

The participants mentioned that AI has been instrumental in handling financial information and obtaining loans. QuickBooks and Kiva are examples of platforms that offer transparent financial statements, determine creditworthiness, and help apply for loans or investments. AI-powered learning platforms such as LinkedIn Learning, Coursera, Skillshare, Udemy, and MasterClass have played a crucial role in entrepreneurial skill development. These platforms provide sector-specific courses relevant to business requirements, enabling entrepreneurs to remain current with market trends, business strategy, and technical skills.

Customer Analytics and Market Insights

AI-based analytics software, such as Google Analytics and Shopify AI, has provided insightful information about customer behaviour, market trends, and preferences. Fashion, catering, and healthcare entrepreneurs have successfully used AI to customize their services, forecast demand, and enhance customer interaction, resulting in business growth.

Workload Minimization and Work-Life Balance

AI-powered automation has reduced workload burdens, especially in repetitive and administrative work. Scheduling, invoicing, customer management, and order processing are now automated, providing business owners greater flexibility.

Breaking Traditional Barriers to Women Entrepreneurs

Table 9: Key Findings of Thematic Assessment

Key Area	Impact of AI	Examples of AI Tools Used
Efficiency & Productivity	Automates tasks, improves scheduling, and enhances client management	HubSpot, Calendly, Epic Systems
Financial Access	Facilitates loan applications, tracks financial health	QuickBooks, Kiva
Entrepreneurial Learning	Provides tailored courses and business insights	Coursera, LinkedIn Learning, Udemy
Market Insights & Analytics	Predicts trends, personalizes offerings	Trendalytics, Google Analytics, Shopify AI
Workload Reduction & Work-Life Balance	Reduces administrative burden, enhances flexibility	MarketMan, Teachable, Thinkific
Breaking Barriers for Women Entrepreneurs	Levels the playing field, enables scalability	AI-driven business tools

Source: Compiled by Authors

Table 9 summarizes key thematic outcomes. AI has revolutionized women entrepreneurs in different industries. Through increased efficiency, access to finance, learning, market information, and automation, AI has helped women expand and scale their businesses more efficiently. The

availability of AI tools has also been instrumental in breaking gender-based barriers in entrepreneurship.

Discussion

The research examined the role of AI in maximizing entrepreneurial success, especially for female-owned businesses. Quantitative survey findings proved a strong positive correlation between AI uptake and several business performance indicators, such as efficiency, finance management, and market intelligence. Regression analysis established that AI tools directly lead to better business performance by streamlining mundane tasks, maximizing financial decision-making, and improving customer interactions. The qualitative interviews then situated these statistical results within the lived experiences of women entrepreneurs from different industries. The respondents underscored how AI has helped streamline operations, with one coach business owner commenting that AI-powered CRM tools and automated scheduling have enabled more client-centred interactions. Conversely, another fashion entrepreneur noted the importance of AI analytics for forecasting trends and inventory optimization, supporting earlier findings that AI makes decision-making more effective through predictive analysis (Shahbazi et al., 2024).

It is a well-evident fact that the adoption of AI in business has resulted in drastic increases in efficiency and productivity. Statistics from a survey show that more than 70% of the respondents attested to boosted efficiency through automation by AI (Al Shehab & Hamdan, 2021). It is backed up by qualitative interviews, whereby entrepreneurs highlighted how AI could carry out administrative processes, like appointments and customer service, so that they can concentrate on the business's primary activities. AI-based platforms such as CRM software, chatbots, and automated scheduling platforms have been instrumental in streamlining day-to-day operations (Al Khayyal et al., 2020; Brynjolfsson & Mcafee, 2017). AI has also made financial management and access to capital easier by using AI-powered financial tools. As noted by respondents, AI has facilitated them a lot in easing bookkeeping and improving credit scoring. This concurs with past research that has indicated that AI enhances financial decision-making using real-time analytics and predictive modelling (Mukherjee, 2020).

AI-powered learning platforms have directly influenced entrepreneurial ability-building. In this regard, platforms like LinkedIn Learning, Coursera,

and Udemy provide tailored courses that sharpen their business acumen and management abilities (Balaji, 2025). Literature validates this by explaining how AI adjusts learning experiences based on individual needs, enabling constant professional development (Bughin et al., 2018).

Balaji (2025) declared AI a game-changer for entrepreneurs due to its ability to perform accurate market analysis and assess customer insights (Challoumis, 2024). This is why these areas have been revolutionized with the adoption of AI. AI-driven tools like Google Analytics and Shopify's analytics suite help entrepreneurs understand customer behaviour, track purchasing trends, and tailor their offerings accordingly. The finding supports the argument that AI enhances data-driven decision-making, a key factor in business sustainability (Nambisan et al., 2019). Automation was broadly recognized as a game-changer that minimizes workload and enhances work-life balance. Business owners in different sectors pointed out how AI automated mundane processes like order processing, invoicing, and communication, freeing time for planning and personal health. This supports evidence in current research, which points to the potential of AI to enhance business efficiency while alleviating burnout (Abadzi & ElAsad, 2021).

Conclusion

The findings of this study underscore impact of AI on entrepreneurship, particularly in enhancing operational efficiency, financial access, skill development, market intelligence, and work-life balance. AI-driven solutions have enabled entrepreneurs to make informed decisions, optimize business processes, and navigate financial complexities more easily. AI has been key in helping women entrepreneurs transcend conventional business impediments. Numerous respondents observed that AI enables them to run and grow businesses with limited teams or extensive resources. This aligns with research supporting the argument that AI solutions make access to business tools universal, promoting gender inclusivity in entrepreneurship. Moreover, AI has contributed to a more inclusive business environment. Future studies must investigate the long-term effects of AI adoption in entrepreneurship, emphasizing ethical implications, possible risks, and developing AI capabilities within business environments.

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ORIGINAL SCIENTIFIC PAPER

Management of Social Intelligence as an Element of Ensuring Personnel Security of the Enterprise: Gender Aspect

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A B S T R A C T

*Gender diversity and awareness of its impact on the effectiveness of management decisions contribute to creating a strong corporate environment, improving team cooperation, and increasing the organization's competitiveness in the modern market. Social intelligence, as one of the key factors affecting team unity, adaptability, and professional competence of employees, requires a deeper analysis of gender specifics. This research aimed to study the gender aspect in the management of social intelligence and its impact on the personnel security of the enterprise, in particular, loyalty and staff engagement. The research found a statistically significant ($p \leq 0.001$***) moderate positive relationship between social intelligence and staff engagement. This indicates the importance of social intelligence for integrating employees into work processes and their effective interaction with colleagues. A statistically significant ($p \leq 0.001$***) moderate*

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positive relationship between social intelligence and staff loyalty was also established, which highlights the importance of social intelligence as a factor associated with personnel security in the enterprise. The research results prove a higher correlation on the Chaddock scale between social intelligence and engagement among men (0.513) compared to women (0.449). In the context of staff loyalty, a higher correlation was found between social intelligence and loyalty among men (0.484) compared to women (0.370). The research results indicate the need to implement gender-oriented approaches in HR strategies aimed at developing social intelligence, which positively impacts team productivity, staff loyalty, and overall sustainability of enterprises. Men should be given opportunities to improve their social skills through participation in communication and leadership training. On the other hand, women should be supported in developing their ability to process social information by engaging in processes that require analysing interpersonal relationships and making decisions in a social context.

KEYWORDS: *social intelligence, personnel security, social skills, corporate culture, gender diversity, loyalty, engagement, personnel management*

Introduction

Despite the active introduction of artificial intelligence technologies, people remain at the center of any organization's functioning. An important task of HR policy is to create conditions for the full disclosure of employees' professional and creative abilities, which is a strategic focus of HR departments. This implies the implementation of effective mechanisms to ensure personnel security, which is the basis for the economic stability of the enterprise, depending on many elements, including the level of employee trust and their integration into the corporate community. The gender aspect plays an important role in this process, as diversity in the team promotes an atmosphere of harmony and mutual understanding, which is the basis for the stability of human resources (Bazán & Camino, 2024). It was found that men and women have different leadership styles, as the former focus on goals related to economic growth and immediate business results, while the latter often take a long-term view, focusing on sustainable growth rather than short-term gains (Kapse et al., 2024). There is also a gender difference in financial involvement, which can affect the specifics of material motivation (Antonijević et al., 2022). Personnel loyalty is formed based on their internal beliefs, moral values, and ethical norms, while the level of employee engagement in the company's life depends on the

management's efforts to adapt them to the values of the organisation (Zhukovska et al., 2024). Ensuring enterprise security is possible only if a comprehensive approach is used, including special measures, tools, and methods. In this context, personnel security is considered a multifaceted process covering social and labour relations between all participants: employers, employees, state structures, and public organisations. Its goal is to reduce the negative impact of internal and external factors on the activities of enterprises (Korauš et al., 2017).

Gender balance is given special attention in the modern world, as equal representation of men and women in the team contributes to balanced management decisions, strengthening of corporate culture, and increasing labour efficiency (Herbinu & Yupono, 2022). Proper application of various methods of personnel management allows an enterprise not only to avoid risks, but also to develop dynamically in a changing environment

Gender-specific social intelligence management involves considering the individual characteristics of men and women in perceiving, processing, and using social information (Rotich & Maket, 2023). This allows us to not only reveal the potential of each employee but also create a more stable and cohesive team. The main focus is on the influence of factors such as moral and ethical principles, psychological resilience, cultural sensitivity, and gender equality among staff (Barreiro & Treglown, 2020). Training employees to manage their emotions and empathy, taking into account cultural and gender differences, is a key step in building a socio-intellectual base that guarantees the stable operation of the enterprise and its development in the long term (Ivashkevych & Spivak, 2023).

This research is based on the hypothesis that the employees' level of social intelligence (SI) significantly affects their loyalty to the organisation and the degree of engagement in joint activities. This assumption is based on previous successful scientific studies that showed a statistically significant relationship between social intelligence and socially important qualities such as loyalty, the desire for personal development, and involvement in social or political spheres (Palaščáková et al., 2023). The analysis of these factors provides a better understanding of the gender distribution of social intelligence, as men and women may have specific differences in perception and interaction in social situations. If social intelligence is proven to have a direct impact on the level of employee loyalty and engagement, this will create opportunities for developing practical tools that HR departments can apply in their work.

For example, it is important to consider that various approaches to employee adaptation may be influenced by a range of factors, including but not limited to gender, which can affect teamwork dynamics. Research suggests that individuals may display varying levels of empathy or strategic thinking depending on their unique experiences and contexts. It is also possible that these traits may be associated with gender characteristics. (Prakash et al., 2023).

It is encouraging that research on emotional intelligence, a related area to social intelligence, found a significant positive impact on employee engagement (Nurjanah & Indawati, 2021). In our research, we decided to test not only the dependence of social intelligence on engagement, but also its impact on loyalty, taking into account gender specifics.

The results of our work will make it possible to develop recommendations for companies wishing to improve their personnel security. These may include gender-balanced HR strategies that incorporate the specifics of the social intelligence of men and women. Successful management of social intelligence in the gender context will become an important tool for improving team effectiveness and strengthening corporate culture, as well as ensuring the economic stability of the enterprise.

Literature Review

Employee loyalty and active engagement are key issues for HR professionals and academics, who emphasise that these factors can be crucial for a company's financial success and economic stability (Milhem et al., 2019). High levels of staff engagement contribute to both individual (e.g., commitment, positive behaviour) and organisational outcomes (increased profitability, increased customer satisfaction). Research shows that individual characteristics of employees influence their willingness to be actively engaged at work (Barreiro & Treglown, 2020). Employees who demonstrate high levels of engagement typically have three main traits: energy, commitment, and dedication (Sanwal & Sareen, 2023).

Effective management of social intelligence in a team involves creating conditions that promote employee motivation (Sun & Bunchapattanasakda, 2019). These conditions can be categorised into three main groups:

- Individual aspects: physical energy level, self-awareness.
- Organisational factors: leadership style, reward system.

– Job specifics: working conditions, type of tasks.

The gender approach and social intelligence are closely related, as gender mainstreaming in work contributes to effective communication and mutual understanding between employees (Dazel, 2013). The development of social intelligence allows better adaptation to the specific needs of different groups and the creation of a harmonious environment that considers each person's characteristics (Liadskyi & Diadyk, 2023 b).

Therefore, these two aspects are key to ensuring the personnel security of an enterprise. Social intelligence has a significant socio-cultural significance that goes far beyond business (Katou et al., 2021). Focusing on the formation of social intelligence from childhood, as well as its further development during studies at educational institutions such as schools, colleges or universities, will help to shape not only responsible and commited employees for public and private institutions, but also conscious citizens capable of defending their state and its interests (Avlaev, 2021).

Among the effective and quick methods for assessing social intelligence, the TROMSØ test developed by Norwegian scientists (Silvera et al., 2001), which identifies three basic components of social intelligence, has gained popularity:

– Social awareness (SA).
– Social information processing (SP);
– Social skills (SS).

The components of social intelligence listed above cover different aspects of a person: susceptibility to external factors, the ability to build an effective communication strategy, and knowledge of the necessary norms, rules, and traditions (Boyatzis et al., 2020). Processing social information is important for career growth and gaining a dominant position in the team (Cooke, 2017; Mast et al., 2020), as it enables a better choice of the right communication strategies. Social skills increase the effectiveness of interaction with others, including maintaining a positive workplace atmosphere (Soto et al., 2024), overcoming conflicts and misunderstandings that can affect employee loyalty (Breil et al., 2022). Social awareness helps a modern person to adapt to the current challenges (Gupta et al., 2021), particularly the digitalisation of the workplace (Ye et al., 2019). All these components of social intelligence, along with other personality traits, significantly impact a person's future achievements, which is why their development should begin in childhood (Soto, 2019). Gender-specific

characteristics should be taken into account in social intelligence education to avoid stereotypes and ensure equal opportunities for socialisation.

The level of staff engagement can be measured using the Gallup Q12 model, a popular tool that assesses this parameter using 12 key questions. This approach has already been used by more than 2.7 million employees from more than 100,000 teams worldwide, covering more than 50 industries (according to the official Gallup.com website). Thanks to this huge amount of data, the company was able to determine the motivation level of employees in different organisations. According to the research, only 26% of employees in the United States are genuinely engaged in the work process and actively contribute to the success of companies, while more than half only formally fulfil their duties, and 19% even create obstacles to the functioning of enterprises (Hastuti, 2022).

Loyalty is another key component in ensuring the personnel security of an organisation, along with staff engagement. The issues of loyalty formation, its manifestations, and impact are of interest to researchers from different fields of knowledge, such as management, psychology, marketing research, sociology, and even jurisprudence (Markina et al., 2018). Loyal employees have a responsible attitude to work, value their positions, strive to achieve high results, grow professionally, and contribute to creating a favourable atmosphere in the team. Such employees motivate their colleagues to fulfil their duties, show patience in crises, and are ready to support the management in making difficult but necessary decisions (Glova & Andrejovská, 2022).

Employee loyalty can be measured using a model developed by researchers Mykyta Nazarov and Zhang Haoyu. They compiled it comprehensively by combining three questionnaires of prominent scientists, namely: L. Porter (Organisational Commitment Questionnaire (OCQ), J. Meyer and N. Allen (Organisational Commitment Scale (OCS-93), and K. Kharsky (Nazarov & Zhang, 2015).

Scientists argue that the level of employee engagement and loyalty is shaped by many factors that can be both internal and external (Noviana & Manafe, 2019). The research analysis (Eketu & Ogbu, 2019; Nurjanah & Indawati, 2021; Develi et al., 2022) suggests that the level of social intelligence and the ability to emotionally adapt play an important role among the individual characteristics of an employee.

Data and Methods

The survey was conducted from 2024 to 2025 on a sample of employees of the enterprise LLC KVF ROMA and the company TERRA of Pervomayskiy city, Kharkiv region, as well as employees of the SPAR retail chain in Poltava, a total of 136 people aged 18 to 67 years, with a gender distribution of 105 women and 31 men. Different positions were also covered, particularly Lower-, Middle-, and TOP-management, which allowed us to systematize the various factors influencing staff loyalty and engagement.

In conducting our study on employee loyalty and engagement, we recognize certain limitations that may influence the interpretation of our findings. The sample of 136 participants, while providing valuable insights, exhibits a notable gender skew (77% women). This disparity may impact the robustness of gender comparisons, highlighting the need for caution in drawing broad conclusions regarding gender differences in social skills and loyalty.

Additionally, the data were gathered from a specific national context in Ukraine. While this focused approach allows for an in-depth exploration of the unique factors influencing employee experiences within these organizations, it may limit the generalizability of our findings to other settings or industries.

We believe that acknowledging these aspects enhances the integrity of our research. Future investigations could benefit from a larger and more diverse sample that includes a broader range of organizational contexts and a balanced gender representation. By doing so, we can further enrich our understanding of the dynamics at play in employee loyalty and engagement and contribute to a more comprehensive discourse in this field.

The research used the standard model of the TROMSØ test, which consists of 21 questions distributed among the three basic components of social intelligence. In order not to overload respondents with the same type of questions, they were given in a different order rather than sequentially for each block (Tables 1-3). Each answer was rated by the respondent on a scale from 1 to 7, where the first mark corresponds to the statement "Not at all about me", and the seventh mark corresponds to "Completely about me."

Table 1: Test questions TROMSØ

Question number	Question
	Block 1. Social information processing
1.	"I can predict the behaviour of other people".
3.	"I know how other people will feel after my actions".
6.	"I understand other people's feelings".
9.	"I understand other people's desires".
14.	" I can often understand what others want without asking them".
17.	"I can predict how others will react to my behaviour".
19.	" I can often tell what others mean by their facial expressions, body language, and expressions".
	Block 2. Social skills
4.	"*I often feel insecure around new people I don't know*".
7.	"I can easily adapt to different social situations".
10.	"I quickly find my way around new situations and meet new people".
12.	"*I find it difficult to establish relationships with other people*".
15.	"*It takes me a long time to understand other people well* ".
18.	"*I am good at choosing the right words when talking to new people*".
20.	"*I find it important to find an interesting topic to talk about* ".
	Block 3. Social awareness
2.	"I often feel that it is difficult for me to understand other people's choices".
5.	"People often surprise me with their actions".
8.	"'Other people get angry with me, but I do not know why".
11.	"People often get angry or annoyed when I say what I think".
13.	"I find people unpredictable".
16.	"'I often offend others without realising it".
21.	"I am often surprised by the reaction of others to what I do".

Source: own processing

Staff engagement was determined using the Gallup Q12 test, which consists of 12 questions that measure four areas: basic needs, individual potential, teamwork, and corporate development (Escobar-Olguín et al., 2024). The questions of the Gallup Q12 test are listed in Table 2. To align with the TROMSØ test responses, we also implemented a rating scale from 1 to 7, where the first mark corresponds to the statement "Not at all about me", and the seventh mark corresponds to "Completely about me."

Table 2: Test questions Gallup Q12

Question number	Question
	Block 1. Basic Needs
1.	Do you know what your employer expects from you?
2.	Do you have the materials and tools you need to do a good job?
	Block 2. Individual contribution
3.	Do you have the opportunity to do what you do best every day?
4.	In the last seven days, have you received any recognition or praise for a job well done?
5.	Do you feel that your manager or someone at work cares about you as a person?
6.	Does anyone at work contribute to your development?
	Block 3. Teamwork
7.	Is your opinion taken into account?
8.	Does your company's mission and purpose make you feel that your work is important?
9.	Do your colleagues feel they must do their job well?
10.	Do you have a best friend at work?
	Block 4. Growth
11.	In the last six months, has anyone at work talked to you about your successes?
12.	In the past year, have you had opportunities to learn and grow at work?

Source: own processing

Employee loyalty was determined using the model developed by researchers Mykyta Nazarov and Zhang Haoyu (Nazarov & Zhang, 2015). The questionnaire includes 15 questions that allow us to assess loyalty in four key areas: a) attitude to the organization; b) loyalty, patriotism; c) attitude to HR policy; d) hidden "turnover", misadaptation (Table 3).

To align the results with the Mykyta Nazarov - Zhang Haoyu and TROMSØ tests, we also introduced a rating scale from 1 to 7, where the first mark corresponds to the statement "Not at all about me", and the seventh mark corresponds to "Completely about me". An anonymous online survey was conducted using a questionnaire created in a Google Form. The research results were interpreted in Microsoft Excel. The relationship between the two variables was established using the Spearman rank correlation coefficient, according to the recommendations of V.F. Bosniuk

(2020), where the independent variable X is social intelligence and its components, and the dependent variable Y is resistance to bullying and mobbing. The interpretation of correlation results was conducted according to the recommendations of U. Turan (2020) using the Chaddock's scale, which allows to determine the strength of the relationship between two variables: 0.1-0.3 – weak; 0.3-0.5 – moderate; 0.5-0.7 – average; 0.7-0.9 – strong; 0.9-1.0 – very strong.

Table 3: Test questions by Mykyta Nazarov and Zhang Haoyu

Question number	Question
	Block 1. Attitude to the organisation
1.	I am ready to do more than is expected of me to make my company thrive and grow.
2.	I always tell my friends that I work for a great company.
6.	I am proud to tell others that I am part of this organisation.
10.	I am very glad that I chose this organisation when I was looking for a job and considering other offers.
13.	I really care about the welfare of the company.
14.	For me, this is the best organisation I could work for.
	Block 2. Loyalty and patriotism
3.	I am not very loyal to the organisation.
4.	I will accept almost any assignment to stay with the company.
9.	Very little change in my circumstances would be required for me to leave the organisation.
	Block 3. Attitude to HR policy
5.	I believe that my values and those of my organisation are very similar
8.	My organisation inspires me to do my best work.
12.	In many cases, I disagree with the main policies of the organisation regarding personnel.
	Block 4. Hidden "turnover" and misadaptation
7.	I would be just as happy to work for any other organisation if I could do this kind of work.
11.	It is not worth staying in one company for a long time.
15.	The decision to start working in this organisation was definitely my mistake.

Source: own processing

The main scientific hypotheses were three assumptions regarding the gender-specific effects of social intelligence on employee loyalty and engagement. The first hypothesis is that women with high levels of social intelligence demonstrate greater engagement in collective activities and support for corporate culture than men. This may be due to their inclination to empathy and ability to better understand the needs of their colleagues.

The second hypothesis emphasises that social intelligence and its components have a stronger impact on loyalty among men than among women. This difference may be related to social roles and expectations shaping workplace behaviours.

The third hypothesis suggests that more active employee engagement policies increase loyalty equally among men and women. Strategic initiatives aimed at improving working conditions make employees feel more comfortable and valued by the company, which positively affects their motivation and satisfaction regardless of gender.

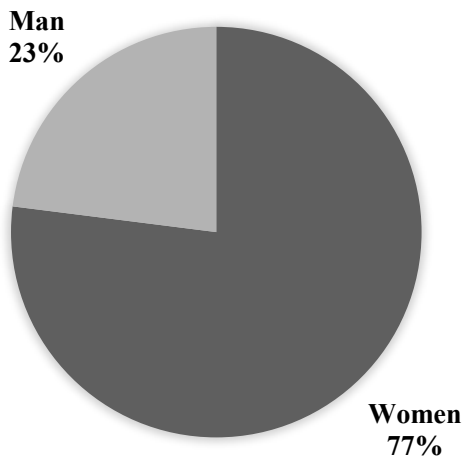
These assumptions form the basis for further research aimed at improving human resource management through developing social intelligence and considering gender differences.

Results and Discussion

The research revealed a gender imbalance in the food trade: 77 percent of respondents were women, while only 23 percent were men. This predominance of the female audience is possibly due to the specifics of professional employment (Diagram 1). However, it is important to consider not only structural factors but also the role of social intelligence, which is often seen as a key competence in this sector. This aspect is important to be analysed as it may affect employment outcomes. This trend may indicate a gender difference in career trajectories. Top management remains less accessible to women, indicating a gender imbalance in access to leadership positions (Diagrams 2 and 3), although social intelligence remains a critical factor for managers. The age analysis showed that most respondents belong to the group of 30-50 years old, which is the most professionally active. Younger and older age categories are represented to a lesser extent, probably due to the specifics of employment and the level of professional experience (Diagram 4). It is worth noting that social intelligence, as the ability to adapt, support teamwork, and resolve conflicts, can be developed through experience and plays an important role in career development. The

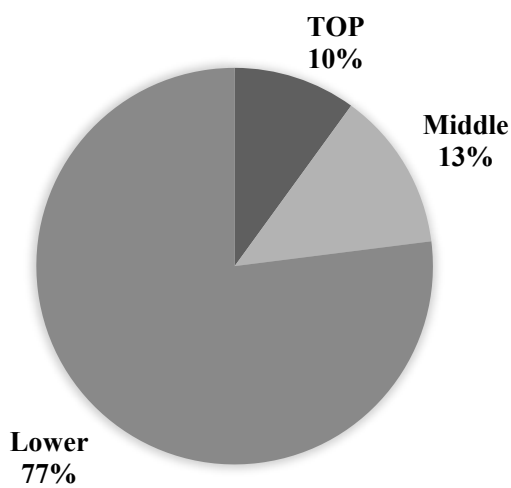
research results highlight gender and job disparities and age-specific labour market characteristics, which provide a foundation for further analysis of gender challenges, social intelligence development, and career prospects.

Figure 1: Gender distribution of survey participants



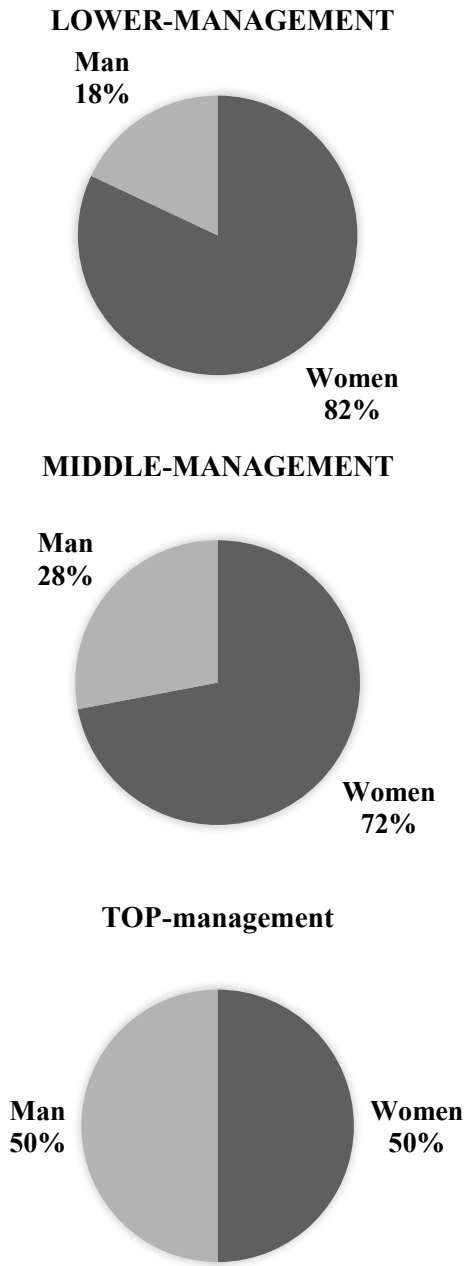
Source: Own processing

Figure 2: Distribution of survey participants by position



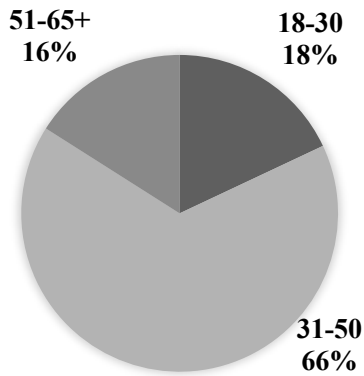
Source: Own processing

Figure 3: Gender distribution of employees by positions:



Source: Own processing

Figure 4: Age distribution of survey participants



Source: own processing

The research revealed that the level of social intelligence of female and male participants did not differ and showed an average score of 5 points (Table 4), which confirms our previous research, which found that men and women do not have significant differences in this trait (Palaščáková et al., 2023). Also, gender differences in engagement levels were not found, which can be explained by the influence of external factors related to corporate culture and social responsibility of the company, which are almost equally perceived by both genders. On the other hand, a comparison of loyalty between men and women revealed that men are 6.4% more likely to show this quality than women, which the difference in social roles and career expectations can explain.

Table 4: Gender aspect of social intelligence, engagement and loyalty

Indicator	Women	Men	Total
Social intelligence	5.21	5.10	5.18
Engagement	5.22	5.24	5.22
Loyalty	5.18	5.51	5.25

Source: Developed by the authors on the basis of their own research

The statistically significant ($p \leq 0.001$***) moderate positive relationship between social intelligence and staff engagement shows that sociable employees are better integrated into work processes, show greater

interest in their work, and interact more effectively with colleagues (Table 5). This is because social intelligence includes the ability to understand social cues, adapt to interpersonal situations, and build productive relationships. Such components of social intelligence as social information processing, social skills, and social awareness contribute to a better understanding of the team's needs, conflict resolution, and the creation of a favourable work environment. It is worth noting that previous research has not found such a significant relationship, which may be due to the specifics of the sample (Liadskyi & Diachkov, 2023a). Last time, research was conducted among Poltava State Agrarian University employees, which may have influenced the results. The education sector has its peculiarities that determine greater involvement in the process than interaction with the team. Another explanation is related to the assumption that teachers need to be able to effectively adapt to changing conditions, such as introducing new teaching technologies or changing curricula.

Table 5: Impact of social intelligence and its components on staff engagement

TROMSØ test criterion / Engagement	**Social information processing**	**Social skills**	**Social awareness**	**General level of social intelligence**
Spearman's correlation coefficient	0.395	0.397	0.372	0.456
Strength of correlation on the Chaddock scale	moderate, positive	moderate, positive	moderate, positive	moderate, positive
Statistical significance of the trait dependence	*p≤0.001***	*p≤0.001***	*p≤0.001***	*p≤0.001***

Note: p≤0.05 – low statistical significance; p≤0.01 – average statistical significance; p≤0.001 – high statistical significance

Source: Developed by the authors on the basis of their own research

The research results prove that men demonstrate a higher level of correlation between social intelligence and engagement (0.513) compared to women (0.449), as shown in Tables 6 and 7. Accordingly, the first

hypothesis was found to be incorrect, as it was assumed that women with high levels of social intelligence would demonstrate greater engagement in collective activities and support for corporate culture compared to men. This difference indicates specific gender differences in the perception and use of social intelligence. Men tend to be focused on the practical application of social skills, which explains their high score in this category (0.538). This may be due to corporate culture, which often encourages men to participate actively in negotiations, strategic planning, and communications management.

On the contrary, women show a higher level of social information processing (0.433), indicating their tendency to empathize, to analyse interpersonal relationships and understand the social context. Evolutionary and social factors can explain this trend. Women have a more developed ability to recognise emotions and build long-term relationships, which is critical for maintaining stable work processes and creating a positive social climate in the team.

Table 6: Impact of social intelligence and its components on employee engagement among the female sample

TROMSØ test criterion	**Social information processing**	**Social skills**	**Social awareness**	**General level of social intelligence**
Spearman's correlation coefficient	0.433	0.367	0.376	0.449
Strength of correlation on the Chaddock scale	moderate, positive	moderate, positive	moderate, positive	moderate, positive
Statistical significance of the trait dependence	*p≤0.001****	*p≤0.001****	*p≤0.001****	*p≤0.001****

Note: p≤0.05 – low statistical significance; p≤0.01 – average statistical significance; p≤0,001 – high statistical significance

Source: Developed by the authors on the basis of their own research

Table 7: Impact of social intelligence and its components on staff engagement among the male sample

TROMSØ test criterion	Social information processing	Social skills	Social awareness	General level of social intelligence
Spearman's correlation coefficient	0.268	0.538	0.358	0.513
Strength of correlation on the Chaddock scale	weak, positive	average, positive	moderate, positive	average, positive
Statistical significance of the trait dependence	*p>0.05*	*p≤0.01***	*p≤0.05**	*p≤0.01***

Note: p≤0.05 – low statistical significance; p≤0.01 – average statistical significance; p≤0,001 – high statistical significance

Source: Developed by the authors on the basis of their own research

A statistically significant (p≤0.001***) moderate positive correlation was found between social intelligence and personnel loyalty, which confirms the importance of developing this indicator for ensuring the personnel security of the enterprise (Table 8). A similar relationship was found for individual components of social intelligence, including social information processing, social skills, and social awareness. The results are consistent with previous research, which also confirmed the relationship between social intelligence and staff loyalty using the example of employees of Poltava State Agrarian University (Liadskyi & Diachkov, 2023a). This suggests that all components of social intelligence contribute to the formation of staff loyalty, which relies on their ability to interact effectively, adapt to the social environment, and understand the interpersonal aspects of organizational culture.

This relationship can be explained by the fact that social intelligence allows employees to better understand the needs and expectations of management and colleagues, predict the consequences of social situations, resolve conflicts effectively, and maintain a harmonious team environment. A high level of social intelligence creates the conditions for building trust, emotional stability, and a sense of belonging to a common goal, which is the basis for loyalty to the organisation. Personnel loyalty to the organisation

can be seen as an extension of these categories, as it is also based on moral guidance, emotional stability and the ability to express collective empathy.

Table 8: Impact of social intelligence and its components on personnel loyalty

TROMSØ test criterion / Political ambitions	**Social information processing**	**Social skills**	**Social awareness**	**General level of social intelligence**
Spearman's correlation coefficient (Bosniuk, 2020)	0.346	0.347	0.301	0.384
Strength of correlation on the Chaddock scale (Turan, 2020)	moderate, positive	moderate, positive	moderate, positive	moderate, positive
Statistical significance of the trait dependence	*p≤0.001***	*p≤0.001***	*p≤0.001***	*p≤0.001***

Note: p≤0.05 – low statistical significance; p≤0.01 average statistical significance; p≤0.001 – high statistical significance

Source: Developed by the authors on the basis of their own research

Comparing the loyalty levels among men and women confirmed a more significant correlation between social intelligence and loyalty on the Cheddock scale, specifically for men (0.484) compared to women (0.370), as shown in Tables 9 and 10. This supports the second hypothesis of our research and may reflect differences in how social roles and expectations are associated with workplace behaviour. The main reason for this could be that men focus on applying social skills in practical activities, favoring their interaction in the corporate environment and ensuring their stability in social relationships in the workplace. An interesting characteristic is the difference in the most active components of social intelligence.

For men, the relationship with social skills loyalty is the strongest (0.505), emphasising their ability to interact effectively in social situations, participate in negotiations, make strategic decisions, and demonstrate leadership qualities. The corporate culture often encourages men to be active in the areas of management and communication. Conversely, women

demonstrate the highest relationship with loyalty in social information processing (0.357), reflecting their tendency to analyse interpersonal relationships, empathy and understanding of social contexts. This difference may be due to women's natural inclination to a deeper understanding of social interactions and the formation of a harmonious atmosphere within the team. Both biological and socio-cultural factors can explain the identified gender peculiarities. In particular, under the conditions of modern corporate culture, men are more often faced with the need to demonstrate proactive behaviour, which strengthens their emphasis on social skills. Women, in turn, due to their natural ability to empathise and analyse social situations, form a more substantial component of social information processing. This confirms the importance of taking into account the gender aspect when managing social intelligence in order to optimise the HR policy of an enterprise.

Table 9: Impact of social intelligence and its components on personnel loyalty among the female sample

TROMSØ test criterion	**Social information processing**	**Social skills**	**Social awareness**	**General level of social intelligence**
Spearman's correlation coefficient	0.357	0.309	0.311	0.370
Strength of correlation on the Chaddock scale	moderate, positive	moderate, positive	moderate, positive	moderate, positive
Statistical significance of the trait dependence	*p≤0.001***	*p≤0.001***	*p≤0.001***	*p≤0.001***

***Note**: p≤0.05 – low statistical significance; p≤0.01 – average statistical significance; p≤0.001 – high statistical significance*

Source: Developed by the authors on the basis of their own research

Table 10: Impact of social intelligence and its components on personnel loyalty among the male sample

TROMSØ test criterion	Social information processing	Social skills	Social awareness	General level of social intelligence
Spearman's correlation coefficient	0.309	0.505	0.303	0.484
Strength of correlation on the Chaddock scale	moderate, positive	average, positive	moderate, positive	moderate, positive
Statistical significance of the trait dependence	*p>0.05*	*p≤0.01***	*p>0.05*	*p≤0.001***

Note: p≤0,05 – low statistical significance; p≤0,01 – average statistical significance; p≤0.001 – high statistical significance.

Source: Developed by the authors on the basis of their own research

Determining the strength of the relationship between loyalty and engagement on the Chaddock scale in the sample of men revealed a significantly strong pattern (0.753) showing their orientation toward effective interaction and active use of social skills (Table 11). In contrast, although the relationship between loyalty and engagement is also significant for women (0.581), it is lower compared to men. This may be because women are more focused on analyzing the social environment than on the active use of social skills, which is positively correlated with their ability to adapt, but at the same time may reduce their reliance on engagement as a factor of loyalty. Thus, the third hypothesis also proved to be false, as it assumed that a more active staff engagement policy would increase loyalty of men and women equally. Men demonstrate a stronger dependence of loyalty on engagement, which can motivate them through access to team projects, initiatives, and decision-making processes. On the other hand, women should be encouraged by enabling interpersonal connections, creating a positive social environment, and increasing their role in information processing, which helps them integrate into the organisational culture.

Table 11: Relationship of staff engagement and loyalty

Engagement and loyalty	Lower	Middle	TOP	Women	Men	Total sample
Spearman's correlation coefficient	0.621	0.429	0.334	0.581	0.753	0.604
Strength of correlation on the Chaddock scale	average positive	moderate, positive	moderate, positive	average, positive	strong, positive	average, positive
Statistical significance of the trait dependence	*p≤0.001* ***	*p≤0.001***	*p≤0.05**	*p≤0.001* ***	*p≤0.001* ***	*p≤0.001* ***

***Note**: p≤0.05 – low statistical significance; p≤0.01 – average statistical significance; p≤0.001 – high statistical significance.*

Source: developed by the authors on the basis of their own research

The pattern of decreasing impact of engagement on loyalty depending on management levels is also interesting: Lower (0.621), Middle (0.429), and Top management (0.334). This phenomenon can be explained by the fact that employees at lower levels of management, who often perform operational tasks, are more reliant on team engagement, which creates a sense of belonging and is associated with motivation. However, managers, especially top managers, already perceive the team as their territory, which reduces their sensitivity to engagement factors. Loyalty for them is likely to come from other factors, such as strategic autonomy, the opportunity to influence decision-making, or the realisation of their ambitions.

The research results open prospects for the development of gender-oriented programmes for social intelligence development in the corporate environment. Men should be provided with opportunities to improve their social skills through participation in communication and leadership training programmes. Women, on the other hand, should be supported in developing their ability to process social information by engaging in processes that require analysing interpersonal relationships and making decisions in social contexts. Considering gender-specific aspects in the development of social intelligence will therefore increase staff loyalty and ensure the personnel security of the enterprise at a strategic level.

Conclusion

The research on the gender aspect of social intelligence management in the context of corporate personnel security emphasizes the importance of gender diversity and its impact on the effectiveness of management decisions. The results show a statistically significant positive relationship between social intelligence, staff engagement, and loyalty, suggesting that social intelligence may play an important role in personnel security strategies. The difference in correlation between social intelligence and engagement, as well as loyalty among men and women, was found, indicating the importance of gender-specific approaches in HR strategies.

This requires the introduction of development programmes tailored to the specific characteristics and needs of each gender: men benefit from improving their communication and leadership skills, while women should be supported in developing analytical skills and social information processing. Such measures will increase employee engagement and loyalty and foster a more resilient and adaptive corporate environment, which is critical in today's market conditions. Further research may focus on developing specific training programmes and evaluating their effectiveness, as well as examining the impact of gender diversity on other aspects of management practice.

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ORIGINAL SCIENTIFIC PAPER

The Mediating Effect of Mindfulness on the Relationship between Authentic Leadership and Self-leadership, Moderated by Gender

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A B S T R A C T

Mindfulness has received increasing attention in leadership research. Yet, its potential to influence the leadership development process remains insufficiently explored. The aim of the study is to evaluate the mediating effect of mindfulness on the relationship between authentic leadership and self-leadership. Given the role of gender in shaping leadership behaviors and experiences, the study also explores the moderating effect of gender on the relationship between authentic leadership and self-leadership. To test the research hypotheses, the study employs partial least squares structural equation modeling (PLS-SEM) in a sample of 208 participants from a developing country, Peru. The key findings are summarized as follows. Authentic leadership has a positive and significant effect on self-leadership and mindfulness, while mindfulness also has a positive and significant effect on self-leadership. Furthermore, mindfulness partially mediates the relationship between authentic leadership and self-leadership. Finally, the moderation role of gender is confirmed, revealing that the relationship between authentic leadership and self-leadership is stronger for women than men. The study not only expands existing knowledge but also offers actionable strategies to foster self-leadership through mindfulness, considering how gender influences the effectiveness of these strategies

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in organizational settings. Future studies could expand the research to include other factors that influence job performance, economic sectors, and other demographic and cultural variables.

KEYWORDS: *authentic leadership, self-leadership, mindfulness, gender*

Introduction

Due to the constant interest of organizations in identifying elements that help improve the performance of their workers, scholars have increasingly focused on exploring the key elements that drive organizational success and individual performance. In this context, self-leadership emerges as a process through which individuals influence themselves to achieve self-direction and self-motivation, which are essential for their performance (Abolfazli & Nourmand, 2016; Kotze, 2016). One significant driver of self-leadership is authentic leadership, which fosters an environment of trust and empowerment, encouraging individuals to take ownership of their actions and self-regulate their behaviors (Schoofs et al., 2024). However, despite its recognized importance, there is limited research examining how authentic leadership promotes self-leadership, particularly in diverse organizational contexts. This gap highlights the need for further exploration into how authentic leadership can effectively support self-leadership development among employees.

Mindfulness represents a powerful psychological tool that enhances focus, emotional regulation, and overall well-being. Its effects, however, extend beyond the individual, influencing broader organizational dynamics. Mindfulness also plays a crucial role in creating a balanced and positive work culture that fosters an entrepreneurial orientation within organizations, encouraging risk-taking, proactivity, and innovation (Prakash et al., 2023). Similarly, mindfulness contributes to leadership effectiveness by improving leaders' ability to remain present, make thoughtful decisions, and navigate complex challenges in dynamic environments. As highlighted by Lee & Jung (2022), mindfulness and self-leadership are interconnected through self-regulation processes, where individuals focus on self-awareness and reflection to effectively pursue their goals.

Empirical evidence suggests that authentic leadership fosters a supportive and transparent environment, which encourages individuals to engage in mindfulness practices as a means of enhancing their self-

regulation and overall well-being (Zhang et al., 2020). This is because authentic leaders model self-awareness, relational transparency, balanced processing and internalized moral perspectives (Walumbwa et al., 2008), creating a culture that values mindfulness as a tool for personal growth and effective decision-making. Similarly, studies demonstrate that mindfulness has a positive impact on self-leadership (Lee & Jung, 2022; Bazán et al., 2024). Thus, mindfulness emerges as an indirect path through which authentic leadership influences self-leadership, fostering the necessary self-regulation and motivation for individuals to lead themselves effectively. However, no research has yet evaluated this mechanism in detail, particularly the mediating effect of mindfulness.

It is important to note that the participation of women in leadership roles is not only a matter of equity but also positively impacts organizational performance and innovation, leading to increased productivity (Novotney, 2023). Research suggests that women and men often differ in leadership styles, with women tending to adopt more collaborative, inclusive, and transformational approaches, while men are often associated with more task-oriented and directive leadership styles. Similarly, women leaders are often more susceptible to mental and emotional challenges compared to their male counterparts, partly due to the higher emotional demands placed on them. This can lead to increased stress, burnout, and emotional fatigue, as they may feel the weight of both their leadership responsibilities and the expectations placed on them to be empathetic and supportive.

Despite the increasing interest in leadership and its related constructs, gaps remain in understanding how mindfulness and gender interact with authentic and self-leadership, particularly in the Latin American context. The present study addresses these gaps by examining the mediating effect of mindfulness on the relationship between authentic leadership and self-leadership. Given the role of gender in shaping leadership behaviors and experiences, the study also explores the moderating effect of gender on the relationship between authentic leadership and self-leadership. The contribution of the study is detailed as follows. From a theoretical perspective, we build on Bandura's (1986) social cognitive theory, using its concepts to explore the mediating effect of mindfulness in leadership processes. From a practical point of view, the study emphasizes its application in the Peruvian context, which faces unique social and cultural challenges (Avolio et al., 2024). Methodologically, the study uses a higher-order construct to measure authentic leadership, which is composed of self-

awareness, relational transparency, balanced processing, and internalized moral perspective. This technique enables the capture of the complexity and multidimensional nature of authentic leadership, providing a more comprehensive understanding of its impact on self-leadership, in contrast to studies that measure it using first-order constructs (Hendrawan et al., 2025).

Theoretical Framework and Conceptual Development

Theoretical Framework

The study explores the relationship between three core constructs, authentic leadership, self-leadership, and mindfulness, each of which plays a crucial role in influencing individual well-being and organizational success. Authentic leadership, characterized by self-awareness, relational transparency, balanced processing, and an internalized moral perspective, is recognized for creating positive organizational climates that foster employee engagement, motivation, and ethical behavior (Walumbwa et al., 2008). On the other hand, self-leadership focuses on how individuals influence their own behaviors and motivations through self-regulation, ultimately enhancing personal and organizational performance (Kotze, 2016). Mindfulness, defined as the intentional awareness and focus on the present moment, further enhances these processes by promoting emotional regulation, decision-making, and workplace well-being (Prakash et al., 2023; Lee & Jung, 2022). Although each construct has been widely studied individually, its integrated impact, especially in the context of leadership development and organizational performance, remains underexplored. This section will delve deeper into how these constructs interact and contribute to individual and organizational outcomes.

In the pursuit of enhancing organizational performance, three factors have been identified that help to improve work performance: authentic leadership, self-leadership, and mindfulness. These factors are associated with the theory of Bandura (1986), who asserts that individuals are capable of influencing their motivation and behavior. In a study with doctoral students, it became evident that authentic leadership and self-leadership should be explained, as both concepts are closely linked theoretically and practically between self-leadership and authenticity and the organizational setup for authentic leadership (Kringelum et al., 2023). While Kringelum et al. (2023) focus on the connection between authentic leadership and self-

leadership in a doctoral student context, Schoofs et al. (2024) extend this understanding by exploring the link between authentic leadership and self-actualization in a broader organizational context.

In a study with voluntary European participants from a single international company, Schoofs et al. (2024) reported the link between authentic leadership and self-actualization, as well as the authenticity of employees, which helps personal development in work environments. Authentic leadership and mindfulness, when combined, create managers with clearer and more focused thinking, enhancing their managerial competencies that help subordinates improve and grow, as evidenced by a sample of nurse managers. (Shurab et al., 2024), thus requiring further study in other sectors.

It is theoretically assumed that self-leadership and mindfulness have important implications for work engagement, such as higher organizational performance, job satisfaction, and employee engagement (Kotze, 2018). Given that these factors play a significant role in leadership effectiveness, it is crucial to examine how gender shapes the way self-leadership and mindfulness are experienced and practiced in organizational settings. Gender influences leadership behaviors, decision-making, and emotional regulation, which in turn affects how individuals apply self-leadership strategies and engage with mindfulness. Men and women often face different expectations and challenges in the workplace, which can impact their ability to exercise self-leadership and engage in mindfulness practices. In this context, the study of the impact of gender becomes particularly relevant, given the increase of women in leadership positions, which is favorable to business growth (Prakash et al., 2023). However, women often must face difficulties to reach managerial positions (Brabazon, 2014). A very small number of women occupy top management in large companies (Antonijević et al., 2022). Therefore, further studies need to be encouraged by considering possible elements such as geographical distribution (Albaddawi, 2024).

Relationships Between Constructs and Hypotheses

Authentic Leadership and Self-leadership

Current approaches to authentic leadership are multivariate and complex, including the perspective of self-formation oriented in the interaction with others and the reciprocity involved in participating in

management processes. Both perspectives relate to the process of self-leadership. The literature has not identified the relationship between authentic leadership and self-leadership, but has found in a study in the public sector in South Africa, positive evidence of self-leadership as an antecedent to authentic leadership, in its four components, in which people with higher levels of self-leadership influence self-awareness, with a better understanding of their strengths and weaknesses, as well as the impact of their behavior, in relational transparency they foster trust by sharing their true feelings, thoughts and emotions, in balanced processing they analyze data objectively before making a decision and solicit opinions from others that challenge their assumptions, finally in internalized moral perspective, they are guided by their own internalized moral standards and values rather than group, organizational and societal pressure, leading to behavior consistent with their internalized values (Kotze, 2016).

We highlight new experiential perspectives on self-leadership as a basis for exercising leadership and essential for the creation of personal authenticity (Kringelum et al., 2023). Considering that every employee has the potential to make a difference regardless of his or her performance, self-leadership also produces positive results for both teams and organizations. It is also gaining more attention along with emerging concepts such as authentic, service, emotional, participative, and shared leadership (Kim et al., 2024). Further studies are needed considering larger, more representative, and authenticity-related samples in different cultures (Schoofs et al., 2024). The emergence of self-leadership and authentic leadership in different contexts, the leadership capabilities required, and the duality and dilemmas inherent in such emergences are important questions for future research; therefore, Hypothesis 1 was formulated as follows:

H1. Authentic leadership and self-leadership have a positive and significant relationship.

Authentic Leadership and Mindfulness

The literature tells us that authentic leadership is connected to mindfulness as both emphasize self-awareness, greater self-awareness of thoughts, emotions, and values (Tan et al., 2023). Authentic leadership is highly relational in nature and relies equally on the individual's inner capabilities, awareness of those capabilities, which helps leaders make deliberate decisions with the organization's resources (Kringelum et al.,

2023). Likewise, there is a theoretical connection between mindfulness and authentic leadership, because both are connected to greater self-awareness of thoughts, emotions, and values (Shurab et al., 2024).

In a study in a hospital in Egypt, it was observed in nurse managers that by increasing their authentic leadership and mindfulness they had clearer and more focused thinking, with a growth mindset that helps subordinates to improve their managerial competencies, so it is necessary to increase the sample of female managers in various leadership positions (Shurab et al., 2024). Therefore, Hypothesis 2 was formulated as follows:

H2. Authentic leadership and mindfulness have a positive and meaningful relationship.

Mindfulness and Self-leadership

A leader who is aware of his or her thoughts, emotions, and behaviors is considered to have high mindfulness and self-leadership capabilities. Likewise, mindfulness plays a fundamental role in the development and strengthening of individual leadership (Chen & Zhang, 2022). Also, several researchers point out that mindfulness favors the growth of self-leadership in different contextual settings, such as the educational process or the workplace. Mindfulness enhances self-leadership by increasing self-awareness, helping people to identify their strengths and areas for improvement, and facilitating the management of personal goals. It also facilitates the development of emotional regulation skills, helps individuals maintain motivation in the face of challenges, and strengthens their self-leadership. In that sense, mindfulness acts as a psychological regulation mechanism that promotes self-leadership in managers.

Mindfulness promotes authenticity by allowing self-discovery and self-awareness, which leads to goal setting that is more consistent with one's personality (Shurab et al., 2024). In addition, the literature has shown that there is a positive relationship between mindfulness as a trait of leaders and self-leadership (Tan et al., 2023). In a study in South Korea with women undergraduate arts majors, it was found that mindfulness of the moment, which is described as mindful, intentional, and nonjudgmental attention, was the factor associated with improving self-leadership. Likewise, there is scarce research on the integration of mindfulness and self-leadership constructs (Lee and Jung, 2022). This reasoning allows us to pose the following hypothesis:

H3. Mindfulness and self-leadership have a positive and significant relationship.

Mediating Effect of Mindfulness on Authentic Leadership and Self-leadership.

Mindfulness and self-leadership are related through people's individual self-regulation to achieve their goals. It is also evident that empathy mediates the relationship between mindfulness and self-leadership, which indicates that mindfulness and empathy could produce positive effects in promoting self-leadership (Lee & Jung, 2022). Mindfulness-based interventions and authentic leadership are connected in that both emphasize greater self-awareness of thoughts, emotions, and values, generating greater autonomy for the leader to transform the organizational culture with improvements in emotional intelligence, managerial competencies, and a minimization of psychological and physical deterioration due to stress (Shurab et al., 2024).

According to Rupprecht et al. (2019), there is a limited amount of research focused on the development of skills such as self-observation, self-regulation, and emotional regulation, which are positively influenced by mindfulness and contribute to the strengthening of both self-leadership and leadership. However, it has not yet been explored how these three variables interact with each other, especially in the context of Latin America, so the following hypothesis is generated.

H4. Mindfulness mediates the relationship between authentic leadership and self-leadership.

Gender Relationship between Authentic Leadership and Self-leadership

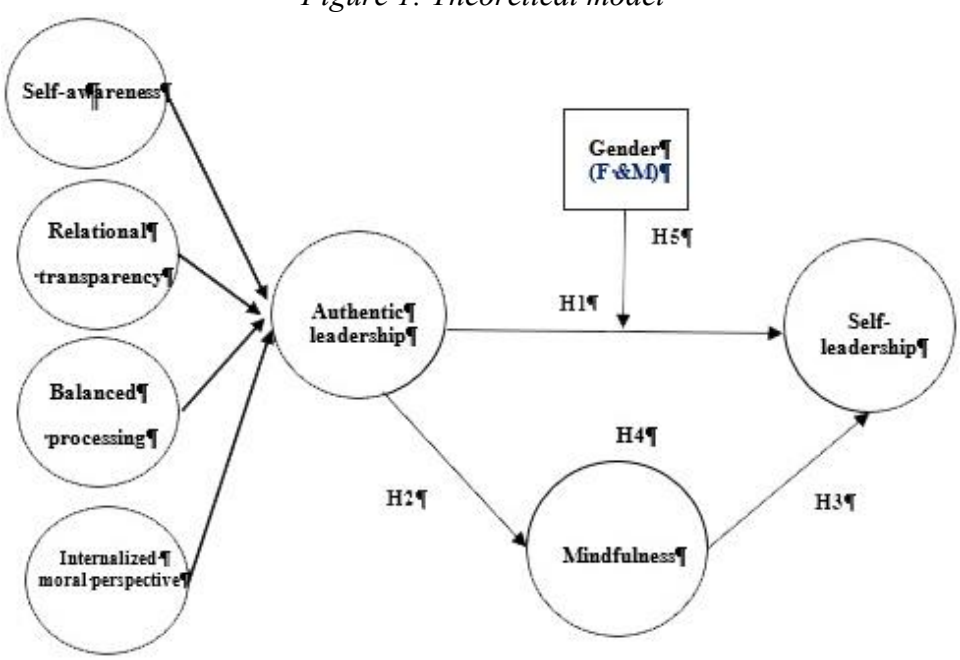
According to the literature, when managers perceive that authentic leaders supervise them, they encounter fewer professional barriers, such as gender discrimination, unequal opportunities, and biased organizational practices. Authentic leadership creates a supportive and transparent environment that fosters trust, fairness, and inclusivity, which significantly enhances occupational well-being. This effect appears to be more pronounced for women in leadership positions, as they often face additional challenges in male-dominated environments (Zhao & Wang, 2025). Research has indicated that authentic leadership can help reduce these

challenges, promoting a more equitable work atmosphere that benefits women and men alike.

Interestingly, some studies suggest that there are no substantial distinctions in relationship-oriented leadership styles between men and women. Similarly, gender seems to have minimal impact on task-focused leadership styles, with both men and women demonstrating similar approaches to goal achievement and decision-making (Abolfazli & Nourmand, 2016). However, the impact of leadership style is not uniform across all employees.

The scientific literature has consistently shown that leadership style and gender play significant roles in shaping subordinates' career and work outcomes. Beyond authentic leadership, gender influences workplace well-being, with women often benefiting more from leadership practices that promote empowerment and trust (Srivastava & Dixit, 2024). This suggests that women may derive greater benefits from authentic leadership because it directly addresses the gendered challenges they face in organizational settings, such as bias or unequal opportunities.

Figure 1: Theoretical model



Note. Single-headed arrows represent hypothetical directional trajectories.

Source: Prepared by the author

Thus, gender moderates the relationship between authentic leadership and self-leadership, with women experiencing a stronger positive effect. This can be attributed to the fact that authentic leadership provides a safe space for women to overcome barriers, fostering the self-regulation, motivation, and confidence necessary for effective self-leadership. In environments where authentic leadership is present, women are likely to feel more empowered to take ownership of their actions and decisions, which enhances their ability to lead themselves and achieve personal and professional growth. Based on this reasoning, the following hypothesis is proposed:

H5. Gender moderates the relationship between authentic leadership and self-leadership.

Finally, Figure 1 shows the research hypotheses.

Methodology

The research instrument consisted of a questionnaire of closed questions with 44 items that reflect the perceptions of individuals on the research variables. To measure self-leadership, the questionnaire proposed by Houghton et al. (2012), which consists of nine questions, was considered. Regarding mindfulness, the questionnaire developed by Brown and Ryan (2003) was selected, which consists of 15 questions. In the case of authentic leadership, the Walumbwa et al. (2008) questionnaire was used, which includes four dimensions: self-awareness (5), relational transparency (5), balanced processing (5) and internalized moral perspective (5). All items were measured on a five-level Likert scale (1 = strongly disagree, 5 = strongly agree).

Since the instrument was originally written in English, the double translation technique was applied to ensure the accuracy of the content in the Spanish version. After applying the double translation technique, four professors-two from management, one from research methodology and one from language-were invited to review the translated version. To verify content validity, each expert evaluated the relevance and clarity of each item. Agreement among reviewers was determined through a series of structured discussions, where experts shared their perspectives and reached consensus on the relevance and clarity of each item. Their suggestions were incorporated to resolve possible problems of ambiguity. After the expert

review, a pilot test was conducted with 15 people. After the pilot test, all feedback was shared with the experts for further adjustments. The individuals who participated in the pilot test were not part of the final study sample.

Data Collection

Data collection was conducted between October and December 2024. The authors sought ethical approval from the Research Ethics Committee for Social Sciences, Humanities, and the Arts of the Pontifical Catholic University of Peru to ensure compliance with ethical standards, including the Declaration of Helsinki. To meet the inclusion criteria, participants should be 18 years of age or older and employed for at least one year. The questionnaire was designed using Google Forms survey management software. It should be noted that each participant was informed about the confidentiality of their answers and data handling. Once the valid responses (n=208) were collected, they were coded according to the level of the 5-point Likert scale (1 = "strongly disagree", 5 = "strongly agree"). Participants were selected using purposive sampling, where individuals were chosen based on specific predefined criteria, such as age and length of employment.

Table 1: Sociodemographic characteristics of the sample

Characteristic	Frequency	Percentage
Gender		
Female	102	49%
Male	106	51%
Age		
24-35	98	47%
36-45	82	39%
46-55	20	10%
over 55	8	4%
Position in the organization		
Senior management	20	10%
Mid-level management/ Supervisor	123	59%
Non-managerial (technical / professional)	65	31%
Sector of the organization		
Commercial	50	24%
Manufacturing	36	17%

Characteristic	Frequency	Percentage
Services	122	59%
Type of organization		
Private	194	93%
Public	14	7%
Total	208	100%

Source: Authors

Table 1 presents the sociodemographic characteristics of the sample used in the study. The sample consists of 208 participants, with 49% female and 51% male. In terms of age, many participants fall within the 24-35 age range (47%), followed by 39% in the 36-45 age range, 10% in the 46-55 age range, and 4% over the age of 55. Regarding organizational position, the largest group consists of mid-level managers or supervisors (59%), followed by non-managerial technical/professional staff (31%), and senior management (10%). The participants come from various sectors, with the most significant proportion working in services (59%), followed by commercial (24%) and manufacturing sectors (17%). The sample is predominantly from private organizations (93%), with only 7% representing public organizations.

Data Analysis

Data analysis included the application of partial least squares structural equation modeling (PLS-SEM), due to its ability to successfully detect significant relationships when sample size is limited and its ability to converge more effectively when using formative constructs, compared to the covariance-based method (CB-SEM) (Hair et al., 2022). Authentic leadership was represented as a reflective-formative construct, in response to the growing criticism toward reflective second-order constructs (Mikulic, 2022). In contrast, self-leadership and mindfulness were represented as reflective constructs.

The data analysis proceeded in a structured sequence. We started with the evaluation of the reflective measurement model, including checks for indicator reliability, internal consistency, and both convergent and discriminant validity. Next, we assessed the formative second-order construct of authentic leadership and its four indicators, evaluating significance and relevance of outer weights, and VIF values. For the validation and estimation of authentic leadership, the two-stage disjoint

approach was employed (Sarstedt et al., 2019). Following this, we evaluated the structural model using 10,000 bootstrapping samples. We began by testing the direct effects, followed by the mediating effect of mindfulness. Finally, we tested the moderation of gender, implementing an interaction term and applying a two-step approach to assess its significance (Hair et al., 2022). During data analysis, the statistical package SmartPLS 4 was used.

Results

Evaluation of the Measurement Model

The first stage of the PLS-SEM application involved the evaluation of the measurement model. With respect to the reflective constructs, indicator reliability, internal consistency reliability, convergent validity and discriminant validity were evaluated. The results of the reliability of the indicators can be found in Annex 1. Model 1 included all the survey indicators. However, six indicators obtained external loadings below 0.4 and had to be eliminated. Particularly, the following indicators were excluded: SA5, IMP2, IMP5, BP2, BP4, and RT4. In contrast, we chose to keep those indicators that obtained external loadings between 0.4 and 0.7 due to their content validity (Hair et al., 2022). Once the indicators below 0.4 were eliminated, Model 2 showed acceptable levels of reliability.

Table 2: Reliability of internal consistency and convergent validity

Construct	Model 1			Model 2		
	α	FC	VME	α	FC	VME
(SL) Self-leadership	0.883	0.906	0.519	0.883	0.906	0.519
(MI) Mindfulness	0.941	0.949	0.556	0.941	0.949	0.556
(SA) Self-awareness	0.690	0.804	0.523	0.824	0.883	0.653
(IMP) Internalized moral perspective	0.593	0.730	0.430	0.801	0.883	0.716
(BP) Balanced processing	0.641	0.678	0.387	0.746	0.854	0.661
(RT) Relational transparency	0.768	0.842	0.535	0.817	0.879	0.647

Source: Authors

The internal consistency reliability was evaluated based on Cronbach's alpha (α) and composite reliability (CR). In both cases (see Table 2), the results of model 2 revealed values above 0.7 and allowed us to conclude that

the measurement model presents adequate levels of reliability. Regarding convergent validity, the average variance extracted (AVE) was calculated. The results revealed AVE values above 0.5 and allowed verifying the convergent validity of the measurement model (Hair et al., 2022).

Discriminant validity was evaluated based on the Fornell and Larcker (1981) criterion and the heterotrait-monotrait ratio of correlations (HTMT) criterion, proposed by Henseler et al. (2015). Table 3 shows the results of the application of both criteria. With respect to the Fornell and Larcker (1981) criterion, the values on the diagonal (square root of the AVE) were greater than the values below the diagonal (correlation between constructs) for each case. With respect to the HTMT criterion, the values above the diagonal (HTMT values) were less than 0.85 (Hair et al., 2022). In both cases, the results allowed testing the discriminant validity of the measurement model.

Table 3: Discriminant validity

Construct	SL	MI	SA	IMP	BP	RT
SL	0.720	0.446	0.461	0.251	0.249	0.398
MI	0.425	0.746	0.522	0.293	0.309	0.433
SA	0.401	0.470	0.808	0.716	0.561	0.847
IMP	0.211	0.257	0.585	0.846	0.507	0.758
BP	0.211	0.260	0.441	0.399	0.813	0.521
RT	0.340	0.383	0.691	0.618	0.406	0.804

Authentic leadership was represented as a second-order formative construct, whose indicators were represented by its four dimensions: self-awareness, internalized moral perspective, balanced processing, and relational transparency. The evaluation of such formative construct involved the level of collinearity, as well as the significance and relevance of the indicators. The level of collinearity was measured from the variance inflation factor (VIF). According to Hair et al. (2022), the VIF values should be less than 3. The results reported in Table 4 indicate that the formative construct indicators do not present critical collinearity problems. To calculate the significance and relevance of the indicators, a bootstrapping of 10,000 replicates was conducted (Becker et al., 2023). According to the results, all dimensions of authentic leadership were found to be positive and significant.

Table 4: Collinearity, significance and relevance

Indicator	VIF	Coefficient	Standard deviation	p-value	CI 95%
Self-awareness	2.159	0.948	0.034	***	[0.865; 0.993]
Internalized moral perspective	1.793	0.498	0.137	***	[0.190; 0.728]
Balanced processing	1.301	0.508	0.123	***	[0.554; 0.918]
Relational transparency	2.228	0.781	0.093	***	[0.004; 0.609]

Note. ***p-value < 0.001.

Source: Authors

Estimation of the Structural Model

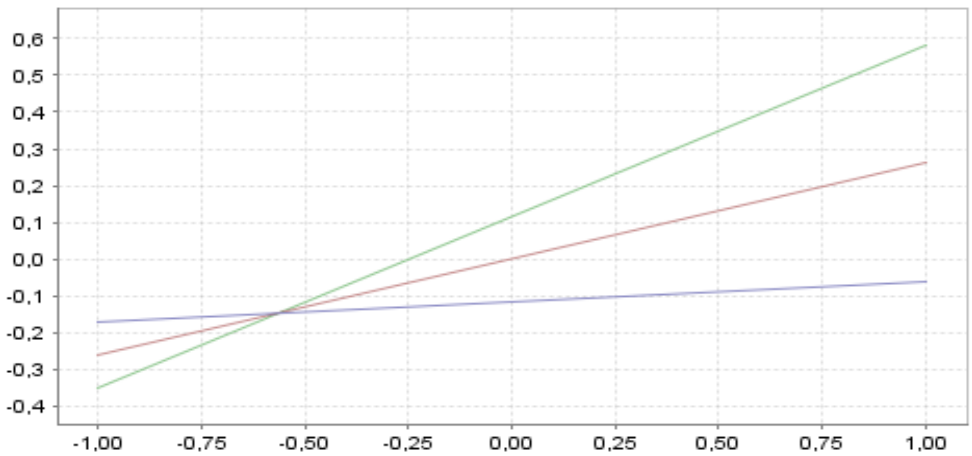
According to Table 5, the relationship between authentic leadership and self-leadership is positive and significant (β=0.301, p-value=0.045). Second, the relationship between authentic leadership and mindfulness is positive and significant (β=0.491, p-value<0.001). Third, the relationship between mindfulness and self-leadership is positive and significant (β=0.270, p-value=0.033). Fourth, mediation analysis revealed that mindfulness mediates the relationship between authentic leadership and self-leadership (β=0.129, p-value=0.031). Lastly, moderation analysis confirmed that gender moderates the relationship between authentic leadership and self-leadership (p-value=0.042). In particular, the results revealed that the relationship between self-leadership and authentic leadership is higher among women than men (see Figure 2). Thus, the results confirmed all the research hypotheses.

Table 5: Results of bootstrapping (10,000 repetitions)

Relationship	Path coefficient	Standard deviation	T statistic	p-value	CI 95%
AL → SL	0.301	0.138	2.003	0.045	[0.057; 0.590]
AL → MI	0.491	0.077	6.255	***	[0.335; 0.638]
MI → SL	0.270	0.137	2.137	0.033	[-0.022; 0.509]
AL → MI → SL	0.129	0.065	2.154	0.031	[-0.012; 0.248]
AL (Gender) → SL	0.202	0.101	2.035	0.042	[0.005; 0.394]

Note. ***p-value < 0.001.

Figure 2: Simple slope analysis



Note. X-axis: authentic leadership; Y-axis: self-leadership; green line: women, blue line: men, red line: no moderation.

Source: Authors

The last step corresponded to the evaluation of the explanatory and predictive power of the structural model. The findings are reported in Table 6. First, the R^2 value of self-leadership (0.239) is similar to those values reported in studies related to the research topic (Conejero-Pérez et al., 2022; Shahzad et al., 2020), indicating that the model has acceptable explanatory power. Secondly, the predictive power was evaluated from the Q^2 index, as well as the RMSE and MAE values. Concerning the Q^2 index, the results showed positive values. In addition, all RMSE and MAE values of PLS were found to be below LM, respectively. Therefore, both criteria lead to the conclusion that the predictive power of the model is adequate.

Table 6: Predictive power

Indicator		PLS		LM	
	Q^2	RMSE	MAE	RMSE	MAE
SL1	0.044	0.762	0.473	0.768	0.476
SL2	0.080	0.838	0.572	0.851	0.584
SL3	0.079	0.778	0.554	0.787	0.564
SL4	0.097	0.911	0.680	0.920	0.694
SL5	0.025	0.947	0.712	0.962	0.726
SL6	0.057	0.987	0.792	0.998	0.807

Indicator		PLS		LM	
	Q^2	RMSE	MAE	RMSE	MAE
SL7	0.020	1.066	0.824	1.083	0.833
SL8	0.099	0.920	0.677	0.929	0.685
SL9	0.079	0.890	0.639	0.896	0.639

Source: Authors

Discussion

The purpose of this study was to analyze the elements that favor the optimization of work performance and to examine how these elements impact such performance. A model was developed and validated using a representative sample across different industries. Regarding the relationship between authentic leadership and self-leadership, the results are consistent with those found in prior literature. The significant relationship between authentic leadership and self-leadership may be explained by the way authentic leaders foster trust, transparency, and empowerment in their followers (Kringelum et al., 2023). Employees influenced by authentic leadership are more likely to engage in self-regulation, set personal goals, and reflect on their behaviors, which directly enhances self-leadership and performance. Therefore, these findings not only confirm existing research but also address a significant gap by highlighting how authentic leadership influences self-leadership, a relationship that was less explored in the literature, which primarily focused on the impact of self-leadership on authentic leadership components (Kotze, 2016). In the Latin American context, where organizations often face hierarchical structures and more traditional leadership models, the impact of authentic leadership could be even more pronounced, as it challenges and reshapes the leadership dynamic, offering employees greater autonomy and involvement in decision-making.

The validation of the relationship between authentic leadership and mindfulness also aligns with the research of Shurab et al. (2024), which was conducted in a different cultural context and reinforces that leaders who possess greater mindfulness capabilities tend to enhance their managerial competencies. Our findings could be attributed to the fact that mindfulness allows individuals to remain calm and focused in high-pressure situations, promoting better decision-making and emotional regulation, which in turn improves leadership effectiveness (Prinsloo & Jooste, 2022). The findings

related to the influence of mindfulness on self-leadership are similarly supported by other scholars (Chen & Zhang, 2022; Lee & Jung, 2022). Mindfulness cultivates an individual's ability to stay present and aware, which is crucial for self-leadership as it encourages self-reflection, self-regulation, and increased motivation. These results also respond to the identified need for more research on the role of mindfulness in the workplace, especially given the scarcity of studies addressing its impact on employee performance (Lee & Jung, 2022). Considering the rapid growth of mindfulness practices in organizational settings, particularly in countries like the U.S. and Europe, Latin America could benefit from integrating mindfulness techniques into leadership development programs, potentially leading to improved organizational outcomes.

Furthermore, the mediating effect of mindfulness on the relationship between authentic leadership and self-leadership, as confirmed by the results, validates the hypothesis and reinforces the accepted direction and influence between these constructs. This finding is particularly significant because it highlights that authentic leadership not only directly affects self-leadership but that mindfulness plays a crucial role in enhancing this relationship, providing a mechanism through which authentic leadership can be even more effective. This supports the need for further research in workplace settings, as suggested by Rupprecht et al. (2019) and Kotze (2018). Given the growing interest in mindfulness and self-leadership, more empirical studies are needed to examine how these elements interact across different cultural and organizational contexts, especially in regions like Latin America, where organizational structures and leadership practices can be quite different from those in Western settings.

Finally, the results revealed that the relationship between authentic leadership and self-leadership is higher among women, reinforcing the well-established notion that leadership style and gender have significant effects on job performance. The study helps clarify how authentic leadership can influence self-leadership behaviors in both men and women, with a stronger positive impact for women. Authentic leadership promotes a supportive environment that encourages individuals to take ownership of their actions, set personal goals, and engage in self-regulation. For women, who often face additional challenges in leadership roles, this type of leadership provides the autonomy and confidence needed to overcome barriers, leading to greater self-motivation and personal growth. In contrast, while men also benefit from authentic leadership, the unique challenges women encounter

in organizational settings make them more likely to experience a pronounced impact on their self-leadership abilities, allowing them to lead themselves more effectively and proactively within their roles. These findings are consistent with Srivastava and Dixit (2024), who suggest that authentic leadership not only improves job performance but also enhances workplace well-being by addressing the gender-based challenges women face in leadership positions. In the Latin American context, where gender inequality remains prevalent in many sectors, the impact of authentic leadership on women leaders could be especially critical in breaking down organizational barriers and promoting greater gender equity in leadership roles.

Conclusion

The research offers practical implications by highlighting the importance of managers actively promoting the application in their organizations of these variables that contribute to the improvement of work performance. Organizations should empower their employees through full attention to the necessary behavioral changes as part of their daily operations to obtain dual benefit, i.e., increased employee well-being and improved firm performance (Prakash et al., 2023). By promoting an environment that encourages authentic leadership and mindfulness, organizations can improve self-leadership among employees, ultimately leading to enhanced job satisfaction and performance.

The presence of more women in leadership roles will contribute to business growth, so organizations need to recruit and train such talent for the benefit of the organization. We suggest that women play a critical role in improving business activities in an organization, especially considering the unique challenges they face in leadership roles. This highlights the importance of promoting gender-inclusive leadership practices to enhance overall organizational effectiveness. This study has certain limitations, given that the research design, data selection, and inferential methods involved unavoidable compromises. In addition, the use of retrospective measures based on managers' perceptions was identified as a possible source of response bias. However, this is a common methodological weakness in research addressing similar issues.

The study achieves its objectives by providing a more complete understanding of the relationship between constructs that have been

mentioned by other authors but have not been comprehensively validated. In doing so, it contributes to the literature by filling a gap in the understanding of how authentic leadership, mindfulness, and self-leadership interact to improve employee performance, with particular emphasis on the moderating role of gender. Therefore, this research provides results on three constructs that influence employee performance and the effect of gender that may affect work efficiency and well-being in the workplace (Albaddawi, 2024; Srivastava & Dixit, 2024). Finally, it is recommended that the model be applied in larger business sectors and other cultural settings. Further studies should continue to incorporate gender as a critical variable, given its strong influence on organizational satisfaction and work efficiency, and the current limitations in the literature surrounding gender in diverse business contexts.

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ORIGINAL SCIENTIFIC PAPER

Determinants of Women's Financial Inclusion: Evidence from the Gulf and the Western Balkan Region

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A B S T R A C T

Women's financial inclusion represents a key element in enhancing women's entrepreneurship. The aim of this study is to investigate the impact of age, education, employment, income quintile, and region on the level of financial inclusion (FI). The data for the four Gulf countries (Gulf Cooperation Council) and five Western Balkan countries were gathered from the Global Findex Database 2017. The total sample includes 3,973 women. Multiple linear regression is used to investigate the impact of socio-demographic factors on FI. Additionally, the paper provides an overview of the latest available data on several indicators related to FI at the macro level. The results show that education, employment, and income have a statistically significant positive impact on FI. The relationship between age and FI is statistically significant, exhibiting an inverted U-shape. This means that FI increases up to 55 years, and after that transition point, it starts to decline. Moreover, the region plays a significant role, considering that the level of

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FI of the respondents from Western Balkan countries is lower than that of those from the Gulf region.

KEYWORDS: *financial inclusion index, socio-demographic factors, age, education, employment, income, Global Findex Database*

Introduction

Women's financial inclusion serves as a catalyst for entrepreneurial activity (Mhlongo, 2025; Ajide, 2020). Additionally, it fosters economic growth and bridges gender inequality (Ozili, 2024; Le Quoc, 2024; Pavón Cuéllar, 2021; Bashier et al., 2022). By enhancing financial inclusion, women can strengthen their economic position (Peterlechner, 2021). Marjanović et al. (2025) emphasized the importance of financial factors within the economic environment for foreign investors. Globally, the gender gap in financial inclusion persists (International Labour Organization, 2025). This is confirmed by Antonijević et al. (2022), who found significant differences between men and women in seven indicators related to financial inclusion. Women face struggles considering the existence of a gender gap in financial literacy (Potrich et al., 2024; Preston et al., 2024; Espinoza-Delgado & Silber, 2024), education (UNESCO, n.d.), participation in the labor market (Fernandez et al., 2024; Castellano & Rocca, 2020), and digital skills (Long et al., 2023; Kuroda et al., 2019). Despite previous studies investigating the drivers of FI in various national contexts, a gap remains in the literature concerning the Gulf and Western Balkan regions (Uddin et al., 2023; Šašić et al., 2024). These studies lacked a novel approach to measuring financial inclusion, overlooked several relevant factors, particularly the potential inverted U-shaped relationship with age, and failed to examine the influence of regions with diverse characteristics. (e.g., religion, culture, level of development, etc.) on the level of FI. Given all the previously mentioned points and the fact that women belong to a vulnerable group, the aim of this study is to determine the impact of socio-demographic factors on the level of women's FI in regions that are similar within countries but diverse across them.

Literature Review

The concept of financial inclusion encompasses individuals' ability to access financial products and services that respond to their needs (World Bank, n.d.). It can be improved by using digital financial services (Ocharive & Iworiso, 2024). The prerequisites for using digital financial channels include internet access, mobile devices, and an adequate level of digital skills. Additionally, Domazet and Marijanović (2024), Lazić et al. (2025), Ivanović and Simović (2020), and Jevtić et al. (2023) highlight the importance of digital competencies in enhancing inclusion within the digital ecosystem. A detailed overview of the latest available data on financial inclusion indicators in the Western Balkans and Gulf regions is presented in Table 1. Data for several countries, including Montenegro, Bahrain, and Kuwait, are not available.

Table 1: Overview of the financial inclusion indicators in the Western Balkans and Gulf region in 2021 (% of respondents)

Indicator	ALB	BIH	NM	SRB	SA	UAE
Financial institution account	44.17	79.34	85.29	89.42	74.32	84.56
Debit or credit card ownership	27.10	61.88	59.28	62.42	72.14	72.37
Saved at a financial institution or using mobile money account	10.48	19.54	14.83	18.63	36.60	10.65
Borrowed from a financial institution	13.39	21.30	22.10	20.65	32.28	22.46
Made a digital payment	17.65	51.09	65.78	59.10	72.11	75.05

Source: Demirgüç-Kunt et al. (2022).

Note: ALB – Albania; BIH – Bosnia and Herzegovina; NM – North Macedonia; SRB – Serbia; SA – Saudi Arabia; UAE – United Arab Emirates.

Prior studies have identified age as a significant determinant of FI (Dar & Ahmed, 2021; Shabir & Ali, 2022). However, many researchers reveal the existence of a non-linear relationship between age and the level of financial inclusion (Ha et al., 2025; Kumar & Pradhan, 2024; Antonijević et al., 2024; Balliester Reis, 2022). This means that financial inclusion rises

with age until reaching a peak, after which it declines. One possible explanation is that younger individuals are excluded because of limited financial literacy and insufficient resources, whereas older individuals tend to show reduced interest in financial products and services, especially after retirement.

Based on the aforementioned literature, the following hypothesis is proposed:

H1: There is a significant inverted U-shaped relationship between age and the level of FI.

It is stated that individuals with a higher level of education possess greater financial capabilities, knowledge, and awareness related to financial well-being (Jeyapaul, 2024). Education has been identified as a significant predictor of financial inclusion (Dar & Ahmed, 2021; Njanike & Mpofu, 2024; Shabir & Ali, 2022; Uddin et al., 2023). In the context of electronic banking and mobile banking applications, several studies suggest that individuals with higher educational attainment are more likely to use these financial services compared to those with lower levels of education (Shankar et al., 2020; Rouse et al., 2025). Based on the aforementioned findings, the following hypothesis is proposed:

H2: Education positively influences the level of FI.

Individuals who are excluded from the labor market often face financial exclusion (Botrić & Broz, 2017). Employment status is considered a key factor that positively impacts financial inclusion (Antonijević et al., 2024; Shabir & Ali, 2022). In the context of digital banking services, Çera et al. (2024) argue that employment status increases the likelihood of using these services. A possible explanation is that individuals in the workforce have access to financial resources and a greater demand for financial services, as they typically receive their salary through a financial institution account. Therefore, hypothesis H3 is formulated as:

H3: Employment positively influences the level of FI.

Numerous authors have stated that income represents a significant determinant of FI (Antonijević et al., 2024; Uddin et al., 2023; Dar & Ahmed, 2021; Balliester Reis, 2022; Njanike & Mpofu, 2024). Additionally, income positively influences the adoption of digital banking services, such as mobile banking (Almanaseer et al., 2024; Shankar et al., 2020). Given the results of previous studies, the hypothesis H4 is developed as:

H4: Income positively influences the level of FI.

The level of financial inclusion differs across countries (Ozili, 2021; Sha'ban et al., 2021; Song et al., 2025) due to variations in development levels, economic conditions, financial system stability, financial literacy, and other contextual factors. In this regard, it is important to examine whether regional affiliation among countries that may share certain internal similarities but differ across regions, has a significant influence on the level of FI. Therefore, the following hypothesis is proposed:

H5: Belonging to the Western Balkan or Gulf region significantly impacts financial inclusion.

Methodology

To investigate the impact of age, education, employment, income quintile, and region on FI, the data from the Global Findex Database 2017 were used for further analysis. The Global Findex databases exist for 2011, 2014, 2017, and 2021. Considering the importance of analyzing regions with diverse characteristics and the unavailability of data for 2021 for many Gulf region countries, the authors decided to analyze the 2017 data by incorporating the latest available country-level macro data. The total number of examined countries is nine, i.e., five Western Balkan countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia) and four Gulf region countries (Bahrain, Kuwait, Saudi Arabia, and the United Arab Emirates). Oman and Qatar were excluded from the analysis due to the unavailability of 2017 data. Table 2 presents the sample structure for each observed county.

Table 2: The structure of the sample for each observed country

Region	Country	Sample size	Age (average)	Education (%)		Employment (%)		Income quintile (%)	
Western Balkan	Albania	581	46.29	1	51.6	1	39.1	1	16.2
								2	16.7
				2	32.2			3	19.6
						0	60.9	4	21
				3	16.2			5	26.5
	Bosnia and Herzegovina	506	47.68	1	35.6	1	37.7	1	15
								2	16.8
				2	50.8			3	23.1
						0	62.3	4	25.1
				3	13.6			5	20
	Montenegro	500	43.71	1	15.8	1	49.2	1	17
								2	18.8
				2	68			3	16.8
						0	50.8	4	23.4
				3	16.2			5	24
	North Macedonia	560	51.80	1	32.1	1	33.4	1	11.1
								2	15.9
				2	44.3			3	18.4
						0	66.6	4	23
				3	23.6			5	31.6
	Serbia	520	50.12	1	21.7	1	41.7	1	14.6
								2	19.6
				2	61.2			3	20.2
						0	58.3	4	21.9
				3	17.1			5	23.7
	Total	2,667	47.97	1	31.9	1	40	1	14.7
								2	17.5
				2	50.6			3	19.6
						0	60	4	22.8
				3	17.5			5	25.3
Gulf	Bahrain	382	34.59	1	5.3	1	58.4	1	13.9
								2	17.5
				2	49.2			3	19.1
						0	41.6	4	25.4
				3	45.5			5	24.1
	Kuwait	305	35.83	1	0.7	1	59.3	1	15
								2	22
				2	48.2			3	19
						0	40.7	4	23
				3	51.1			5	21
	Saudi Arabia	362	30.14	1	8	1	55.2	1	17.1
								2	19.3

				2	55.5	0	44.8	3 21 4 19.9 5 22.7
				3	36.5			
	United Arab Emirates	257	37.22	1	3.9	1	70.4	1 16 2 21.8 3 20.6
				2	33.8	0	29.6	4 21.4 5 20.2
				3	62.3			
	Total	1,306	34.16	1	4.7	1	60.1	1 15.5 2 19.9 3 19.9 4 22.5 5 22.2
				2	47.7	0	39.9	
				3	47.6			
TOTAL SAMPLE		3,973	43.43	1	23	1	46.6	1 15 2 18.3 3 19.7 4 22.7 5 24.3
				2	49.7	0	53.4	
				3	27.4			

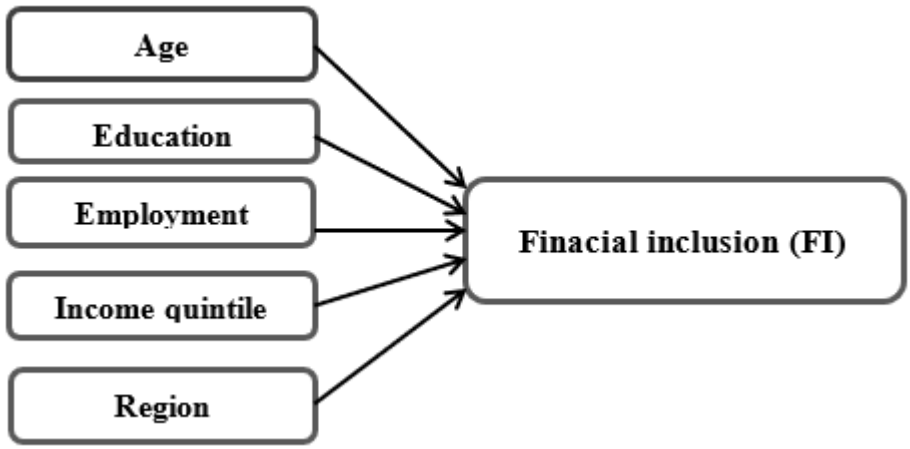
Notes: Education: 1 = primary school or less, 2 = secondary school, 3 = tertiary education or more; Employment: 1 = in the workforce, 0 = out of the workforce; Income quintile: 1 = 20 % of the population with the lowest income, 5= 20 % of the population with the highest income

Source: Authors' calculation based on Global Findex Database (Demirgüç-Kunt et al., 2018).

Among the observed countries, North Macedonia recorded the highest average age of female respondents, whereas Saudi Arabia recorded the lowest. Generally, the Gulf region has a young population, with an average age of 34.16. Regarding education, Western Balkan countries are dominated by those who have completed secondary school, while respondents from the Gulf region have mostly completed secondary education or higher. Around ¼ of the Western Balkan respondents belong to the fifth income quintile, while Gulf respondents are predominantly from the fourth and fifth income quintile groups. Approximately 60% of respondents in the Western Balkan region are out of the workforce, while around 60% are in the workforce in the Gulf region, indicating disparities in women's participation in the labor market.

The conceptual model developed for this research is presented in Figure 1.

Figure 1: Conceptual model



Source: Authors

Following the conceptual model, the dependent variable is financial inclusion (FI), while the independent variables include socio-demographic variables. The multiple linear regression was applied to test the hypotheses. A detailed overview of the variables in the model, along with their coding, is presented in Table 3. The statistical package SPSS 23 was used to conduct the analysis, with a significance level of 5% ($\alpha = 0.05$).

Table 3: Variables – coding for multiple linear regression

Variable type	Variable	Coding
Independent: socio-demographic factors	Age	The variable is continuous
	Age squared	The variable is continuous
	Education	1= primary school or less 2= secondary school 3= tertiary education or more
	Employment	1 = Employed 0 = Unemployed
	Income quintile	1= 20% of the population with the lowest income (0-20%) 2= 20-40% 3=40-60%

Variable type	Variable	Coding
		4=60-80% 5=20% of the population with the highest income (80-100%)
	Region	1= Gulf 2= Western Balkan
Dependent variable: Financial inclusion*	Financial Institution Account (FIA)	1 = Has an account at a financial institution 0 = Does not have an account
	Debit card ownership (DCO)	1 = Owns a debit card 0 = Does not own a debit card
	Saved at a financial institution in the past 12 months (S)	1 = Has saved 0 = Has not saved
	Borrowed from a financial institution in the past 12 months (B)	1 = Has borrowed 0 = Has not borrowed
	Made bill payments online (MBPO)	1 = Has made an online bill payment 0 = Has not made an online bill payment

** Financial inclusion is measured by financial inclusion index, composed of the FIA, DCO, S, B and MBPO.*

Source: Authors

In this study, the financial inclusion index, which measures the level of financial inclusion, is the modified version of the index introduced by Antonijević et al. (2024). Instead of the variable "any digital payment," the authors used "made bill payments online" as a proxy variable, considering there are no available data in the dataset for 2017. For the purpose of the analysis, it is calculated as follows:

$$\text{Financial inclusion index (FII)} = 0.3 * FIA + 0.1 * DCO + 0.1 * B + 0.1 * S + 0.4 * MBPO \quad (1)$$

This indicator takes values in the range from 0 to 1. The lowest level of financial inclusion is 0, while the highest value of financial inclusion is 1.

Results and Discussion

The sample structure with respect to the components of the financial inclusion index is presented in Table 4.

Table 4: Distribution of respondents by components of the Financial Inclusion Index in 2017, by country (% of respondents)

Country	FIA		DCO		S		B		MBPO		FII (average)
Albania	**1**	39.6	**1**	25.6	**1**	7.6	**1**	8.8	**1**	1.4	0.16
	0	60.4	**0**	74.4	**0**	92.4	**0**	91.2	**0**	98.6	
Bosnia and Herzegovina	**1**	60.5	**1**	42.5	**1**	6.3	**1**	6.9	**1**	8.7	0.27
	0	39.5	**0**	57.5	**0**	93.7	**0**	93.1	**0**	97.3	
Montenegro	**1**	74	**1**	39.8	**1**	10.4	**1**	16	**1**	5.8	0.31
	0	26	**0**	60.2	**0**	89.6	**0**	84	**0**	94.2	
North Macedonia	**1**	80.9	**1**	56.1	**1**	21.8	**1**	12.7	**1**	9.6	0.37
	0	19.1	**0**	43.9	**0**	78.2	**0**	87.3	**0**	90.4	
Serbia	**1**	78.3	**1**	65.2	**1**	14	**1**	14	**1**	14.6	0.39
	0	21.3	**0**	34.8	**0**	86	**0**	86	**0**	85.4	
Total Western Balkan	**1**	66.2	**1**	45.6	**1**	12.1	**1**	11.6	**1**	7.9	0.3
	0	33.8	**0**	54.4	**0**	87.9	**0**	88.4	**0**	92.1	
Bahrain	**1**	83.2	**1**	79.6	**1**	31.9	**1**	14.7	**1**	39.5	0.53
	0	16.8	**0**	20.4	**0**	68.1	**0**	85.3	**0**	60.5	
Kuwait	**1**	80	**1**	78.7	**1**	27.5	**1**	17.7	**1**	39	0.52
	0	20	**0**	21.3	**0**	72.5	**0**	82.3	**0**	61	
Saudi Arabia	**1**	60.5	**1**	55.8	**1**	10.2	**1**	5.5	**1**	21.3	0.34
	0	39.5	**0**	44.2	**0**	89.8	**0**	94.5	**0**	78.7	
United Arab Emirates	**1**	78.6	**1**	75.1	**1**	25.3	**1**	16.3	**1**	42.4	0.52
	0	21.4	**0**	24.9	**0**	74.7	**0**	83.7	**0**	57.6	
Total Gulf	**1**	75.3	**1**	71.9	**1**	23.6	**1**	13.2	**1**	34.9	0.47
	0	28.1	**0**	28.1	**0**	76.4	**0**	86.8	**0**	65.1	
TOTAL SAMPLE	**1**	69.2	**1**	54.2	**1**	15.9	**1**	12.1	**1**	16.8	0.36
	0	30.8	**0**	45.8	**0**	84.1	**0**	87.9	**0**	83.2	

Source: Authors' calculation

Respondents from the Gulf region demonstrate a higher level of financial inclusion, as evidenced by higher percentages in each component of the financial inclusion index, including account ownership, debit card

ownership, saving at and borrowing from a financial institution, and making bill payments online.

The results of the multiple regression models are presented below (Table 5).

Table 5: Summary of the model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.525a	.276	.275	.239026001207031

Source: Authors' calculation

The results indicate that the model is statistically significant ($F(6, 3966) = 251.538$, $p < .001$), while the predictors explain 27.5% of the variance in financial inclusion.

A detailed overview of the results of the multiple linear regression is presented in Table 6.

Table 6: Multiple linear regression analysis - results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.022	.032		.694	.488
Age	.006	.001	.405	5.539	**.000**
Age^2	-5.470E-5	.000	-.334	-4.480	**.000**
Education	.101	.007	.254	15.326	**.000**
Employment	.120	.009	.214	13.861	**.000**
Income quintile	.031	.003	.155	10.765	**.000**
Region	-.111	.009	-.186	-12.218	**.000**

Source: Authors' calculation

The results of the multiple linear regression suggest that all hypotheses are supported.

The analysis reveals that a significant inverted U-shape relationship exists between age and FI. To calculate the transition point, the following formula is used:

$$\text{Transition point} = -\frac{\beta_{age}}{2*\beta_{age^2}} \quad (2)$$

The turning point is 54.88, indicating that financial inclusion increases up to that age, after which it begins to decline. The results align with those of other authors (Balliester Reis, 2022; Kumar & Pradhan, 2024). However, the results are opposite to those of Zins and Weill (2016). A possible explanation for this finding is that younger individuals, due to financial limitations and unemployment, are excluded, while older individuals tend to show less interest in financial services in later years. The results of the analysis suggest that the level of education has a significant positive influence on financial inclusion. This finding is consistent with those of Park and Yi (2025), Song et al. (2024), Luo (2024), and Turhan (2024) but contrasts with earlier evidence from Chaudhary et al. (2022), who found no significant association between education and usage of DFS. Employment was found to have a significant positive influence on women's financial inclusion, as evidenced by Bekele (2023), Balliester Reis (2022), and Soumaré et al. (2016), indicating that employed women have access to financial resources and a greater interest in using financial services. Achakpa and Radović-Marković (2018) claim that education and entrepreneurship development can be crucial drivers of women's employment and empowerment. Regarding the income quintile, the results indicate a significant positive influence on FI. This finding aligns with the results of Park and Yi (2025) and Nguyen et al. (2023), but differs from those reported by Onyia and Tagg (2011). The region is also a statistically significant predictor, indicating a lower level of financial inclusion among women from the Western Balkans compared to those in the Gulf region. Given the cultural, digital infrastructure, and development differences between these regions, this finding is consistent with the results of Song et al. (2025), Ozili (2021), and Sha'ban et al. (2021).

Although this study contributes to the broadening of the theoretical knowledge base, it has several limitations. First, the findings cannot be generalized to women from other regions. Future research should include women residing in the least developed countries. Second, the model explains 27.5% of the variance, indicating the need to incorporate additional

variables. Further studies could examine the influence of digital skills and financial literacy levels on financial inclusion. Third, this study analyzes data from 2017. Researchers should explore more recent data from Gulf countries when it becomes available in the next Global Findex Database.

Table 7 provides an overview of the results.

Table 7: The overview of the results

Hypothesis	Description	Result
H1	Age → FI (inverted U-shape)	✓
H2	Education → FI	✓
H3	Employment → FI	✓
H4	Income quintile → FI	✓
H5	Region → FI	✓

Source: Authors' calculation

The findings underscore the importance of national policies that focus on both young and older women, enhancing their opportunities to attain higher levels of education, participate in the labor market, and generate income.

Conclusion

Women's financial inclusion represents a crucial area for improvement, as it contributes to reducing gender inequality and fostering economic growth (Ozili, 2024; Le Quoc, 2024). Considering that women face numerous obstacles in education and labor market participation, it is important to investigate the predictors of their financial inclusion. Previous studies have not analyzed regions such as the Western Balkans and the Gulf, which are characterized by diverse cultures, levels of digital infrastructure, and stages of development, using a modified version of the financial inclusion index.

The aim of this study is to examine the impact of socio-demographic factors on women's financial inclusion. The data were gathered from the Global Findex Database 2017, as data for most Gulf countries were unavailable in 2021. To test the hypotheses, multiple linear regression was

applied. The results indicate that age, education, employment, income quintile, and region significantly influence women's FI. The study identifies an inverted U-shaped relationship between age and FI. Thus, financial inclusion increases up to the age of 55, after which it starts to decrease. Enhancing financial inclusion should be a strategic priority for relevant stakeholders, including policymakers, ministries of finance and economic development, central banks, and international development organizations, as it is a critical driver of women's entrepreneurship (Mhlongo, 2025; Ajide, 2020; Goel & Madan, 2019; Fareed et al., 2017).

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ORIGINAL SCIENTIFIC PAPER

Restricted Ambitions: Analyzing Barriers to Women's Advancement in Serbia's Public Sector

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A B S T R A C T

This paper explores the "sticky floor" phenomenon that hinders women's career progression in the public sector in Serbia. This little-researched concept impedes the career path of women, especially in the early stages of their careers.

The paper applied a theoretical review and quantitative analysis based on a survey of 100 employees in the public sector in Serbia, with the aim of investigating specific challenges such as a lack of support in career development, the elimination of social stereotypes, and better business-private life coordination. The research used a validated instrument from previous studies to develop the questionnaire, whereas the chi-square test of independence and cross-tabulation analysis were used for data analysis. Women reported a higher incidence of challenges related to lack of mentorship, difficulties in balancing work and family responsibilities, societal stereotypes, and gender-based discrimination. The goal of the research is to identify factors that hinder women's advancement and better understand the paths to success. Also, it has been investigated how possible it is to overcome all the obstacles mentioned.

The study proposes relevant recommendations and new policies, including various education programs on workplace bias awareness development, better

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support programs, and more flexible working conditions in order to break down the barriers of the "sticky floor" and promote a more inclusive environment for the advancement of women in the public sector in Serbia. This research will allow us to understand better the challenges in women's career development as well as to encourage a more supportive work environment.

KEYWORDS: *sticky floor, women, advancement, public sector, gender equality, barriers, professional development*

Introduction

A problem visible in the process of advancement in the public sector in Serbia is reflected in the barriers preventing the career development of women. This problem is particularly pronounced at lower positions and in the sectors of an organization where hierarchy is more present. According to the available Gender Equality Index for the Republic of Serbia from 2021 (Babović & Petrović, 2021), it is evident that the percentage of women in managerial positions is around 28%, whereas only 18% of women occupy leadership positions in the public sector. The report highlights the "sticky floor" phenomenon as a major factor limiting their progression, especially in the public sector in Serbia.

The "sticky floor" deals with various barriers that hinder women's advancement from entry-level to higher positions in organizations. In relation to this phenomenon, the "glass ceiling" concept has also been identified as the one that determines and explains the barrier to higher management positions that women in organizations encounter (Cotter et al., 2001; Smith, 2015). Those barriers are perceived in various systemic, structural, cultural and institutional circumstances. While both concepts address gender inequality, the sticky floor captures the more pervasive, early-career constraints such as lack of mentoring, biased evaluations, and limited advancement (Smith, 2015; Tošković, 2013). Though often invisible, these barriers have a significant impact in the early stages of women's careers.

The differences are particularly noticeable in public institutions where politicization of public administration and traditional norms limit women's mobility and advancement (Acker, 2006; Ridgeway, 2011).

Studies show that women are greatly limited due to weak institutional support and traditional norms. The situation is no different in Serbia, where the "sticky floor" phenomenon additionally stands out (Rahman et al.,

2024). Studies also indicate that despite technological progress bringing prosperity and progress in various areas of life, it has not helped women in overcoming different systemic and structural barriers to the same extent as it has for men (Salamzadeh et al., 2024).

The position of women, with the emphasis on managerial and entrepreneurial roles, has drastically worsened over the past few years, and especially after the COVID-19 pandemic. The crisis highlighted the great vulnerability of women by increasing caregiving expectations, while institutional empathy and support were lacking (Agu et al., 2024; Salamzadeh et al., 2024). Efforts recognized and made visible through digitization have not empowered women, nor have they served as a support in their empowerment efforts. Women often remain at a disadvantage and do not have access to training programs, mentoring, and other development opportunities (Machado et al., 2025; Banyan Global, 2020).

Acker's theory of "inequality regimes" explains how gendered power dynamics are embedded in bureaucratic norms, with informal bias particularly evident at higher levels (Acker, 2006). Ridgeway (2011) emphasizes that leadership remains linked to masculine traits, disadvantaging women who do not conform.

In Serbia, the "sticky floor" phenomenon is shaped by a combination of historical, political, and cultural events and differences. The legacy of socialist gender equality, encouraging women to be a part of the labor force and at the same time strengthening the traditional role of women at home directly causes the existence of a "double burden" for women (Blagojević, 2009). Such a legacy has caused a situation where women today hold significantly lower-paid positions or administrative positions that are of no influence in decision-making processes within organizations.

Another factor significantly influencing the unfavorable position of women is the politicization of public administration, which obstructs the possibility of women's advancement and mobility (Petrušić, 2018).

Comparative studies conducted in post-socialist countries such as Hungary, Poland, and Bulgaria indicate similar patterns of gender stagnation despite major legal reforms being carried out. Authors such as Fodor (2002) and Glass and Fodor (2007) claim that while the social regimes promoted women's employment, they failed to free themselves from the rigid patriarchal norms within the organizations, thus leading to the current situation that there is an informal resistance to female leadership and that gender stereotypes are deeply rooted in public institutions. These studies

only reinforce the necessity for dealing with the "sticky floor" phenomenon in Serbia through both local and transnational lenses.

The "sticky floor" phenomenon has also been analyzed in terms of feminist organizational theory. It indicates that the phenomenon is rather present in different patterns of behavior and discrimination, thus directly affecting the levers of power when it comes to gender equality and creating an informal organizational environment not supportive of women (Acker, 2006; Eagly & Carli, 2007; Dokmanović, 2024).

Obstacles that prevent women from advancing in their careers can be classified as cultural norms, institutional discrimination and various social stereotypes**.** Women face all the obstacles mentioned daily in their working environment (Eagly & Carli, 2007; Benschop & Doorewaard, 1998). Apart from the obvious problems that they have in balancing business and private life, they also face cultural problems, lack and unavailability of mentors and organizational culture development (Sharma, 2022; Eagly & Carli, 2007).

In Serbia, other obstacles prevent women from advancing within organizations, i.e., barriers related to education and access to advancement opportunities based on gender differences**.** Men in the public sector usually hold leadership positions and have a significant role in the decision-making process, whereas women are often given administrative roles (Ćopić, 2016). Another aggravating aspect is that women cannot obtain the qualifications necessary for advancement through institutional support and appropriate resources, which is recognized as a deficiency of the current educational system (Banyan Global, 2020).

One of the key issues identified is the lack of promotion opportunities for women as well as limited or inadequate access to appropriate management training, thus further limiting women from participating in professional development programs (Ćopić, 2016; Banyan Global, 2020). According to research conducted by Lazarević-Moravčević et al. (2023), women who attended specialized or MBA programs had greater opportunities to move to management positions in the public and private sectors. Nevertheless, disparities in access to these programs exist, and problems related to gender stereotypes greatly affect and discourage women from applying to various development programs (Benschop & Doorewaard, 1998).

This paper aims to investigate how systemic barriers—such as social stereotypes, lack of work-life balance, limited mentoring, and unsupportive workplace climates—contribute to the "sticky floor" effect in Serbia's

public sector. Adopting a feminist perspective, it explores gender inequality as a structural issue requiring deep institutional change. The survey of 100 public sector employees in Vojvodina, across managerial and non-managerial roles, is used to examine perceptions of career barriers by women and men. The findings offer practical implications for institutional reform and gender-sensitive policy development, including the introduction of structured mentoring programs, enhanced access to professional development, the reduction of gender stereotypes, and greater representation of women in decision-making roles.

Multifaceted "Sticky Floor" and Its Impact

The "sticky floor" phenomenon encompasses persistent early-career obstacles that keep women in low hierarchical positions despite adequate education and strong performance (Smith, 2015). Different factors, such as cultural norms and social contexts that function within an organization, significantly contribute to this phenomenon. Cultural norms portray women primarily as caregivers, limiting their career ambitions (Cotter et al., 2001). Inadequate mentoring reduces women's confidence and professional support (Cross et al., 2019). Rigid organizational practices and poor work-life balance further restrict advancement (Acker, 2006). Social stereotypes portraying women as less capable for leadership exacerbate these issues (Davies et al., 2004). Collectively, these studies illustrate how complex and multifaceted the "sticky floor" phenomenon is and the impact it has on women's career paths.

When perceived from the aspect of education, the "sticky floor" phenomenon is particularly noticeable, especially in relation to the public sector. Namely, though women make up most graduates from various universities in Serbia, their advantage is rarely proportionally represented in their professional advancement. According to the research of the Institute for Philosophy and Social Theory (2019), barriers that are recognized as educational stereotypes and appear as early as primary and secondary school direct girls towards traditionally feminized fields such as education, health, and administration, which generally provide fewer opportunities for leadership positions (Institut za filozofiju i društvenu teoriju, 2019). Such gender stereotypes are only further reinforced and continue at the higher education level.

Access to development training programs is limited due to family obligations and a lack of institutional support, which reduces women's mobility and growth opportunities (Banyan Global, 2020). Gender stereotypes in educational materials further undermine girls' confidence and aspirations (Petrušić, 2018).

In addition to all visible and alarming problems within organizations, a significant problem lies in the poor and very slow institutional response to these challenges. Institutions should actively promote the best solutions and practices to fight biases and change harmful practices. Therefore, it is crucial to define solutions that would be visible and of a longer-term character, which are supported by appropriate material resources and assistance from educational institutions, thus strengthening the women's careers in the future. In this context, it is important to empower women in the earlier stages of education, so that these issues are identified in the earlier stages and, as such, prevented from becoming a bad example and practice. Such initiatives also contribute to solving the shortcomings in organizations related to the generation gap and challenges in the areas of equality, equity and gender equality. Otherwise, the "sticky floor" phenomenon will continue to be an issue for generations to come.

Women in the Public Sector: Achievements and Challenges

Research on the role of women in the public sector indicates both significant achievements and numerous challenges. Despite more women becoming involved in the public sector, thus creating new perspectives and more inclusive policymaking (UNDP, 2021), gender inequality still persists. According to the data available for gender equality for 2021 in the Republic of Serbia, women do not occupy leadership positions in a satisfactory percentage (Babović & Petrović, 2021). Also, there are various systemic, structural and cultural norms that make it difficult for women to advance in the public sector. Some of the barriers are recognized to be bad employment practices, lack of training and mentoring opportunities, as well as stereotypes that women are incapable of taking leadership positions and are not ready to take on leadership roles. The European Institute for Gender Equality emphasizes that these problems are often exacerbated by old and conservative modes of operation, which are deeply rooted in tradition (European Institute for Gender Equality, 2020).

In Serbia, many women still occupy lower-paid positions, thus making it difficult for them to take part in decision-making processes. Therefore, in addition to changing the law, it is necessary to create such an organizational climate and culture to provide adequate support for women so that they can advance and assume leadership positions.

Global Trends and the Serbian Context

Studies show that there are certain systemic and structural barriers that make it difficult for women to obtain leadership positions in the public sector worldwide (Benschop & Doorewaard, 1998; Dennissen et al., 2018). Slaughter (2015) further discusses the concept of "double duty" applied to women, particularly to those holding leadership positions. This means that women have to fulfill traditional gender roles, and at the same time, constantly prove their abilities so as to fight the stereotypes and practices that hinder their careers.

In the Republic of Serbia, the gender equality index for 2021 shows a score of 58 out of a possible 100 points, reflecting widespread stereotypes that are deeply rooted within organizations (Babović & Petrović, 2021). This indicates that the imbalance affects approximately every other woman. In addition, the second segment of the report deals with the sphere of power, especially in political, economic, and social decision-making processes. This index increased by 18.5 points compared to the results from 2014. These positive changes are mainly the result of the appropriate application of legal norms aimed at increasing the representation of women in various institutions. There is a noticeable increase in the participation of women in the legislative bodies of the Republic of Serbia, such as the National Assembly and the Government of the Republic of Serbia. The participation of women has increased to approximately 40% (Babović & Petrović, 2021). Despite the improved formal scores, the index suggests that gender gaps still exist when it comes to economic power. Women are still underrepresented in leadership positions, even in the private sector in Serbia, and they still face wage inequality. Furthermore, the time domain, which measures the balance between the paid and unpaid work, shows stagnation due to outdated data from 2015. The COVID-19 pandemic has further exacerbated these inequalities, especially for women, in terms of limited access to employment.

The Human Rights Education in Serbia (2021) report indicates that education about human rights, including gender equality, is not systematically implemented in schools. The normative framework supports equality and non-discrimination, but many obstacles exist in practice, including inadequate curriculum implementation, lack of trained teachers, and no visible results in the educational process itself (Koturović et al., 2021).

The results show that Serbia is making progress in formal gender representation, yet cultural norms and institutional barriers and practices hinder women's advancement. A common and more comprehensive approach is needed to bridge the gap between policy and practice and for the public sector in Serbia to truly support gender equality. The approach should include better regulatory norms, raise awareness at all levels and introduce key changes in the education system.

Research Methodology

This study addresses the limited opportunities for advancement of women employed in the public sector in Serbia. Therefore, the aim of the paper is to highlight the disparities in career advancement opportunities between men and women, and to examine the challenges faced by women in the public sector.

The research for this study was conducted during September and October 2024. Quantitative research used a questionnaire developed based on previous empirical studies on barriers to women's career advancement (Lyness & Thompson, 2000; Banyan Global, 2020). The questionnaire contained demographic and closed-ended questions aimed at examining the perception of barriers in the areas of mentoring support, work-life balance, gender discrimination and organizational culture. The research was conducted on a sample of 100 employees in managerial and non-managerial positions in various public sector institutions located in major urban administrative centers of the Autonomous Province of Vojvodina. Respondents were selected using the random sampling method, and the data were collected electronically (via an online questionnaire), with the anonymity of the participants having been ensured. The questionnaire was previously tested through a pilot study (n=10) to check the clarity of the question formulations.

The sample structure by gender, age, experience and level of education is shown in Table 1. The sample consists of 32 male respondents (32%) and 68 female respondents (68%). In the age category, the most respondents fall under the category between 41 and 50 years of age (34%), followed by 51 to 60 years (25%), 31 to 40 (20%), 18 to 30 years (17%) and 61 to 70 (4%). When it comes to experience, the largest number of respondents have between 10 and 20 years of experience (37%), 28% have between 20 and 30 years of experience, 23% have up to 10 years of experience, while 12% of respondents have over 30 years of experience. In the category of education, most respondents are in the category of high school (59%), followed by college (32%) and 9% with a master's degree.

Table 1: Distribution of respondents by gender, age, experience and level of education

	N	**%**
Gender		
Male	32	32
Female	68	68
Age		
18-30 years	17	17
31-40 years	20	20
41-50 years	34	34
51-60 years	25	25
61-70 years	4	4
Experience		
Up to 10 years	23	23
10-20 years	37	37
20-30 years	28	28
Over 30 years	12	12
Education		
High school	59	59
College	32	32
Master	9	9

Source: Author's calculation

Based on the analyzed theoretical background and set research objectives, the following hypotheses were set:

H0: It is expected that a significantly higher number of women than men will report facing challenges in career advancement in the public sector.

H1: The lack of mentorship as a career advancement challenge differs between men and women.

H2: Balancing work and family responsibilities affects career advancement differently for men and women.

H3: Societal stereotypes about the role of women, as a challenge to career advancement, differ between men and women.

H4: Gender-based discrimination, as a challenge to career advancement, differs between men and women.

Hypothesis testing was made possible by the application of Pearson's chi-square test, while the method of cross-tabulation was used to determine the frequency or proportion of cases in each of the categories. The statistical software used for data processing and testing of proposed hypotheses is IBM SPSS version 22. For a result to be significant, the significance level should be 0.05 or less (Pallant, 2020). Therefore, the level of statistical significance was set at $p<0.05$.

Research Results

To examine whether there is a significant relationship between challenges related to career advancement in the public sector and gender, we used the Pearson chi-square test (Table 2). The chi-squared test of independence showed a significant relationship between challenges related to career advancement in the public sector and gender χ^2 (df = 1, n = 100) = 24,698; p = 0,000.

Table 2: Relationship between challenges related to career advancement and gender (Pearson Chi-Square test)

		Value	df	Significance
Challenges to career advancement	Pearson Chi-Square	24,698	1	0,000
	Likelihood Ration	23,775	1	
	Linear-by-Linear Association	24,451	1	
	N of Valid Cases	100		

Source: Author's calculation

The results show (Table 3) that the number of women (87%) who stated they face career advancement challenges in the public sector is significantly higher than the number of men (38.7%) who face similar challenges. On the other hand, the number of men (61.3%) who did not perceive any challenges in their career advancement in the public sector is notably higher compared to the number of women (13%).

Table 3: Challenges to career advancement in the public sector by gender

			Gender		Total
			Male	Female	
Challenges to career advancement	Yes	Count	12	60	72
		Structure (%)	16,7%	83,3%	100,0%
		% within Gender	38,7%	87,0%	72,0%
	No	Count	19	9	28
		Structure (%)	67,9%	32,1%	100,0%
		% within Gender	61,3%	13,0%	28,0%
	Total	Count	31	69	100
		Structure (%)	31,0%	69,0%	100,0%
		% within Gender	100,0%	100,0%	100,0%

Source: Author's calculation

After proving that career advancement in the public sector is different for men and women, an attempt was made to determine the individual challenges that women face to a greater extent than men. A chi-square test of independence was performed to examine the relationship between gender

and individual challenges in career advancement. The results of the chi-squared test of independence (Table 4) show a significant relationship between lack of mentorship and gender χ^2 *(df* = 1, *n* = 100) = 23,391; *p* = 0,000.

Table 4: Relationship between individual challenges related to career advancement (Lack of mentorship) and gender (Pearson Chi-Square test)

		Value	df	Significance
Lack of mentorship	Pearson Chi-Square	23,391	1	0,000
	Likelihood Ration	23,613	1	
	Linear-by-Linear Association	23,157	1	
	N of Valid Cases	100		

Source: Author's calculation

A lack of mentorship as a challenge to career advancement in the public sector is reported by a significantly higher percentage of women (76.8%) compared to men (25.8%).

Table 5: Individual challenges for career advancement (Lack of mentorship) in the public sector by gender

			Gender		Total
			Male	Female	
Lack of mentorship	Yes	Count	8	53	61
		Structure (%)	13,1%	86,9%	100,0%
		% within Gender	25,8%	76,8%	61,0%
	No	Count	23	16	39
		Structure (%)	59,0%	41,0%	100,0%
		% within Gender	74,2%	23,2%	39,0%

Source: Author's calculation

When it comes to balancing work and family responsibilities, the chi-squared test of independence shows (Table 6) a significant relationship

between balancing work and family responsibilities and gender χ^2 (df = 1, n = 100) = 8,486; p = 0,004.

Table 6: Relationship between individual challenges related to career advancement (Balancing work and family responsibilities) and gender (Pearson Chi-Square test)

		Value	df	Significance
Balancing work and family responsibilities	Pearson Chi-Square	8,486	1	0,004
	Likelihood Ration	8,500	1	
	Linear-by-Linear Association	8,401	1	
	N of Valid Cases	100		

Source: Author's calculation

Female respondents were more likely to report balancing work and family responsibilities (66.7%) compared to men (35.5%).

Table 7: Individual challenges for career advancement (Balancing work and family responsibilities) in the public sector by gender

			Gender		Total
			Male	Female	
Balancing work and family responsibilities	Yes	Count	11	46	57
		Structure (%)	19,3%	80,7%	100,0%
		% within Gender	35,5%	66,7%	57,0%
	No	Count	20	23	43
		Structure (%)	46,5%	53,5%	100,0%
		% within Gender	64,5%	33,3%	43,0%

Source: Author's calculation

The chi-squared test of independence shows (Table 8) a significant relationship between societal stereotypes about the role of women and gender χ^2 (df = 1, n = 100) = 7,677; p = 0,006.

Table 8: Relationship between individual challenges related to career advancement (Societal stereotypes about the role of women) and gender (Pearson Chi-Square test)

		Value	df	Significance
Societal stereotypes about the role of women	Pearson Chi-Square	7,677	1	0,006
	Likelihood Ration	7,569	1	
	Linear-by-Linear Association	7,600	1	
	N of Valid Cases	100		

Source: Author's calculation

Societal stereotypes about the role of women are identified as a challenge to career advancement in the public sector by a significant higher percentage of women (71.0%) compared to men (41.9%).

Table 9: Individual challenges for career advancement (Societal stereotypes about the role of women) in the public sector by gender

			Gender		Total
			Male	Female	
Societal stereotypes about the role of women	Yes	Count	13	49	62
		Structure (%)	21,0%	79,0%	100,0%
		% within Gender	41,9%	71,0%	62,0%
	No	Count	18	20	38
		Structure (%)	47,4%	52,6%	100,0%
		% within Gender	58,1%	29,0%	38,0%

Source: Author's calculation

A chi-square test of independence was performed to examine the relationship between gender and gender-based discrimination as a challenge to career advancement in the public sector and the results of the chi-squared test of independence show (Table 10) a significant relationship between these two variables χ^2 (df = 1, n = 100) = 21,861; p = 0,000.

Table 10: Relationship between individual challenges related to career advancement (Gender-based discrimination) and gender (Pearson Chi-Square test)

		Value	df	Significance
Gender-based discrimination	Pearson Chi-Square	21,861	1	0,000
	Likelihood Ration	23,359	1	
	Linear-by-Linear Association	21,643	1	
	N of Valid Cases			

Source: Author's calculation

A significantly higher number of women (66.7%) than men (16.1%) report experiencing gender-based discrimination as a challenge to career advancement in the public sector.

Table 11: Individual challenges for career advancement (Gender-based discrimination) in the public sector by gender

			Gender		Total
			Male	Female	
Gender-based discrimination	Yes	Count	5	46	51
		Structure (%)	9,8%	90,2%	100,0%
		% within Gender	16,1%	66,7%	51,0%
	No	Count	26	23	49
		Structure (%)	53,1%	46,9%	100,0%
		% within Gender	83,9%	33,3%	49,0%

Source: Author's calculation

Results show that there is a significant relationship between gender and these enumerated career advancement challenges in the public sector. The number of women facing these enumerated career advancement challenges in the public sector is significantly higher compared to the number of men facing these career advancement challenges in the public sector.

Discussion

The quantitative approach used in this study provides insights into the interconnected factors behind the "sticky floor" in Serbia's public sector,

aligning with theoretical frameworks on organizational regimes of inequality and reproduction of gender norms (Acker, 2006; Ridgeway, 2011). The research results validate earlier findings of gender disparities in public administration across multiple national settings (Segovia-Pérez et al., 2021; Subramaniam et al., 2014).

The findings align with international research showing that women face multiple career obstacles, including limited mentorship, work-life imbalance, and persistent stereotypes, even when holding positions equal to men, with restricted access to networks and informal support (Lyness & Thompson, 2000). This is also evident in Serbia's public sector, where women encounter similar informal barriers.

International studies further confirm the universality of this issue. In the analysis of the Spanish labor market (Carrasquer Oto & Martínez-Portillo, 2023) systemic horizontal segregation and barriers at lower-level positions were identified, thus shedding light on the structural and institutional dimensions of the "sticky floor" phenomenon and revealing strong parallels with the situation in Serbia's public sector. The research (Ahmad & Naseer, 2015) shows that formal gender equality policies do not automatically eliminate deep-rooted discriminatory practices, which means that policy implementation alone is not enough to overcome embedded workplace inequalities. Another research (Ciminelli et al., 2021) on OECD countries found that "sticky floor" effects within workplace practices significantly contribute to the gender wage gap, particularly by limiting women's advancement from lower-tier positions.

The formal mechanisms and legal frameworks for gender equality in Serbia have not removed significant professional development barriers for women, which stem from institutional and cultural patterns, a gender-segregated labor market, and inconsistent anti-discrimination policy implementation (Dragičević & Mihić, 2020). Our findings show that insufficient mentoring, persistent stereotypes, and discriminatory practices sustain the "sticky floor" effect even in organizations that formally endorse equality principles, indicating that nominal equality is ineffective without active measures to address often invisible obstacles. The Coordination Body for Gender Equality (2021) further notes that these barriers are frequently informal and culturally embedded, and legal frameworks alone are insufficient to remove them.

Pirju et al. (2024) found persistent gaps in income, education, and life expectancy in former European communist states, highlighting the need for

structural policies where formal mechanisms fail, and confirming the relevance of our findings to similar transitional contexts.

The socialist legacy of Serbia maintains a “double burden” on women by encouraging their workforce participation while maintaining conventional household responsibilities. When combined with public sector politicization and clientelism, these factors further hinder the effective implementation of gender-sensitive policies (Bertelsmann Stiftung, 2024).

Based on the research findings, practical recommendations can be identified: establishing mentoring programs for women, training managers to recognize unconscious biases, and introducing flexible work arrangements without negative consequences. The interventions need to become a part of a gender equality strategy, which includes gender-sensitive performance indicators for tracking progress (UN Women, 2020; European Institute for Gender Equality, 2021). This research provides empirical evidence on the “sticky floor” in Serbia’s public sector, expanding knowledge of workplace inequality in transitional societies and validating the adaptation of international theoretical frameworks to the country’s institutional and cultural context (Dragičević & Mihić, 2020).

Conclusion

This study contributes to the understanding of the "sticky floor" phenomenon in Serbia’s public sector by demonstrating how the established institutional practices and social norms restrict women’s career advancement even though the government endorses gender equality principles. Relying on the theoretical frameworks of the “sticky floor” and “glass ceiling” phenomena and empirical data obtained through a survey, the study identified major barriers, including insufficient mentoring and role models, inflexible work schedules, gender-based stereotypes, and discriminatory practices in recruitment, task allocation, and promotion. By applying international concepts to Serbia’s post-socialist institutional framework, the research reveals how the official legal framework interacts with informal mechanisms that exclude certain groups, offering a more comprehensive analysis of the institutional dynamics of gender inequality in post-socialist societies.

Based on the findings, four specific institutional actions are recommended: (1) developing formal mentoring programs for women in the public sector, (2) introducing flexible work arrangements, such as remote

work and flexible working hours, (3) launching programs to address gender stereotypes and unconscious biases and (4) maintaining rigorous anti-discrimination policies for equal gender opportunities.

Although the study has certain limitations such as a small sample size, a limited geographical scope, and self-reported data, it provides valuable insights into "sticky floor" mechanisms in public administration through its analysis of the situation in Serbia. Future research needs to implement longitudinal study designs to monitor women's career development over time.

The intersectional analyses need to be carried out to study how gender discrimination affects different groups who face marginalization based on ethnicity, social class, disability and sexual orientation. The assessment of gender equality promotion policies requires both comparative studies between different sectors and countries and rigorous evaluations of existing institutional interventions.

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ORIGINAL SCIENTIFIC PAPER

Feedback Quality and Job Performance: The Roles of Feedback Seeking and Gender Similarity in Entrepreneurial Firms

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A B S T R A C T

This study investigates the relationship between feedback quality (FQ), feedback-seeking behavior (FSB), and job performance (JP), incorporating the moderating role of gender similarity. Considering samples from two industries, oil/petrochemical and banking in Iran, the organizations selected in these industries were among those that exhibited entrepreneurial behavior and could be considered entrepreneurial organizations. Also, using LISREL, Sobel, and SPSS

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software to analyze the data collected by questionnaires, four of the hypotheses of this research were confirmed. The findings show that high-quality feedback positively impacts job performance and enhances feedback-seeking behavior. Moreover, feedback-seeking behavior acts as a mediator between feedback quality and job performance. While gender similarity was hypothesized to moderate the relationship between feedback quality and feedback-seeking behavior, the results did not support this role; however, gender similarity independently influenced feedback-seeking behavior. These findings underscore the importance of providing high-quality, actionable feedback and fostering environments encouraging feedback-seeking for performance improvement. So, this study has clarified the complex relations between feedback quality, feedback-seeking behavior, job performance, and gender similarity and has contributed to a more accurate understanding of how these factors influence each other. From a practical perspective, designing feedback systems that emphasize quality, training managers to deliver constructive feedback, and addressing gender dynamics in workplace interactions can lead to improved job performance.

KEYWORDS: *performance management, feedback seeking behavior, feedback quality, job performance, gender similarity*

Introduction

Performance management is a widely recognized human resource management system aimed at enhancing individual and group performance. Decades of research in this field have revealed that the effectiveness of a performance management system relies not only on its technical and procedural components but also on human interactions and performance conversations. This issue has prompted a shift in performance management literature towards emphasizing the psychological aspects of manager-employee interactions in day-to-day performance management activities. A key component of such interactions is the conversations about performance feedback (Rabbani & Alavi, 2023). Feedback plays a crucial role in employees' performance by providing insights into how supervisors perceive their work, their performance, and what needs to be modified to achieve the expected goals. High-quality feedback (FQ) enhances employees' confidence and activates behavioral motivation systems, with positive feedback signaling rewards and negative feedback indicating potential punishment (Nae et al., 2015; Ilies et al., 2007). Providing feedback to improve performance is a common management practice (Drouvelis & Paiardini, 2022). FQ is characterized by specificity,

consistency over time, and clear information on behaviors and processes linked to goals and outcomes. When employees receive detailed, high-quality feedback, especially regarding their standing among peers—their performance improves compared to low-quality or absent feedback. Enriching feedback with task-related strategies and behaviors further strengthens its positive impact on performance (Whitaker & Levy, 2012). Additionally, effective feedback processes should allow active participation from the recipient (Lizzio et al., 2003). Previous research emphasizes the importance of employees actively seeking feedback in professional settings, which involves seeking information aimed at evaluating and reflecting on work processes and individual performance. Feedback-seeking behavior (FSB) demonstrates an individual's proactive efforts to assess the appropriateness of their behavior or performance to achieve a specific goal (Nae et al., 2015). Employees extend beyond official organizational channels to seek feedback from various sources and apply it in their daily work routines. This perspective has led to a new direction in feedback research towards exploring feedback-seeking behaviors rather than focusing solely on feedback content (Lam et al., 2017). FSB is defined as a "conscious devotion of effort toward determining the correctness and adequacy of behaviors for attaining valued end states" (Ashford, 1986). This behavior serves as a proactive individual tactic to achieve job-related insights that may not otherwise be available (Lam et al., 2017). Feedback-seeking has five key aspects, including how and when feedback is sought, its frequency, the goal behind seeking it, and the subject matter of the feedback. These aspects indicate an individual's choices when deciding whether to seek feedback (Crommelinck & Anseel, 2013). Over more than three decades, FSB has been linked to numerous positive outcomes, including enhanced performance, more accurate self-perception, and career advancement (Froehlich & Segers, 2021). It also supports social acceptance and adaptation, especially in uncertain environments (Vandenberghe et al., 2021). Therefore, employees' feedback seeking plays a pivotal role in performance conversations by providing opportunities to identify performance issues and potential solutions. The content of feedback-seeking has been investigated in depth in previous studies. Park et al. (2007) proposed three types of feedback individuals could seek: diagnostic, normative, and assurance. Diagnostic feedback guides behaviors and actions that require improvement to achieve performance targets. Normative feedback compares an employee's performance with that of peers, potentially highlighting underperformance, while assurance feedback

affirms correct actions or achieved goals, encouraging the repetition of desired behaviors. Feedback-seeking content reflects the type of questions asked, the expected outcomes, and whether the feedback sought is positive or negative and related to processes or outcomes (Rabbani & Alavi, 2023). Given the significance of feedback quality and FSB in performance management, numerous studies have examined their interrelation (Dahling & Whitaker, 2016; Gong et al., 2017; Whitaker & Levy, 2012; Zhang et al., 2020). Nae et al. (2015) found that beyond its direct effect on job performance, feedback quality also shapes the relationship between FSB and performance, strengthening it when perceived quality is high. The relationship between feedback and performance is stronger when perceived feedback quality is high. Prior studies have examined various moderators in this relationship, including employees' perceived feedback quality and trust in supervisors (Nae et al., 2015), feedback-seeking culture (Evans & Dobrosielska, 2021), political skill (Dahling & Whitaker, 2016), and leader–member exchange (Lam et al., 2017). Based on theoretical and empirical evidence, this study introduces a novel model exploring the relationship between feedback quality and work performance, the mediating role of feedback-seeking behavior (FSB), and the moderating role of gender similarity. Scientifically, the model advances understanding of the complex interactions among these variables and addresses gaps in the literature on organizational psychology and human resource management. From a practical standpoint, the findings can help organizations recognize the importance of delivering high-quality feedback and fostering FSB to improve performance. Examining gender similarity also offers insights into how gender dynamics shape workplace feedback processes, supporting the development of more inclusive feedback practices. The study focuses on entrepreneurial organizations, including those with substantial female participation, and is structured into six sections covering the theoretical background, research methods, results, hypothesis discussion, and conclusions.

Literature Review

In this section, the theoretical foundations of this research are investigated, and the hypotheses are presented accordingly.

Feedback Quality and Job Performance

According to Information theory (Shannon, 1948), an event, such as receiving or perceiving feedback, is only informative when there is initial uncertainty. This theory is based on the concept of entropy, a measure of uncertainty, which quantifies how much information is inherent in a message. So, high entropy indicates high uncertainty, and each new piece of information can reduce this uncertainty. In other words, if an individual is completely certain about the appropriate response and the potential evaluations of that response, then the feedback loses its informative value. So, feedback is only informative to the extent that it adds new knowledge or understanding (Ashford & Cummings, 1983). Moreover, considering the high signal-to-noise ratio and optimal channel capacity as basic elements of communication, other characteristics of high-quality feedback can be inferred. It should minimize irrelevant or distracting information, ensuring the main message is clear and actionable. It should also use an appropriate medium that can convey the necessary information. High-quality feedback has been utilized as one potential component of management strategies that can enhance productivity, and the relation between feedback quality and performance has been investigated in this regard. Drouvelis and Paiardini (2022) examined how varying the feedback quality causally affects performance when monetary incentives are ruled out. The study concluded that low-quality feedback can reduce employees' intrinsic motivation and lead to lower performance levels compared to situations where clear, high-quality feedback is provided. In addition, their research underscores the advantageous impact of high-quality feedback on productivity, implying that the quality of the feedback provided mainly matters in increasing job performance (JP) (Drouvelis & Paiardini, 2022). In another research by Nae et al. (2015), it was observed that though employees actively sought feedback from supervisors, if they perceived it as low-quality information or content, their work performance was not improved. Based on these findings, the first hypothesis of this study is formulated as follows:

H1: Feedback quality has a positive effect on job performance

Feedback Quality and Feedback-Seeking Behavior

The feedback quality construct has become a theoretically significant contextual factor influencing FSB and is consistently highlighted in the models linking feedback seeking to job performance. Whitaker and Levy

(2012) have shown that feedback quality is positively related to feedback seeking. They highlighted the importance of FQ in organizations that seek to increase FSB and improve job performance. By emphasizing the strong link between FQ and its utility, the results of their study suggest that low-quality feedback may significantly dampen feedback utility for most employees (Whitaker & Levy, 2012). On the other hand, the quality of feedback information to enhance the task performance is probably higher when an individual actively seeks feedback when needed. Feedback quality can enhance self-efficacy and the probability of using the feedback to improve job performance (VandeWalle, 2003). Therefore, the second hypothesis of this study is formulated as follows:

H2: Feedback quality has a positive and significant effect on FSB

Feedback-seeking Behavior and Job Performance

Feedback-seeking behavior (FSB) has notable implications for employees' adaptation, socialization, learning, creativity, and performance (Crommelinck & Anseel, 2013). Its relevance to job performance is often linked to self-regulation, as individuals who actively seek feedback are generally more effective. However, the feedback–performance relationship remains mixed, with some studies reporting positive, null, or even negative effects (Asumeng, 2013). FSB effectiveness depends on contextual factors. Leader-member relations play a critical role in determining whether FSB enhances job performance (Lam et al., 2017). Task characteristics also matter; moderate-difficulty tasks are preferred because they provide diagnostic feedback on ability without attributing outcomes solely to external factors. This aligns with achievement motivation theory, which emphasizes selecting tasks that inform self-assessment rather than those guaranteeing success (Atkinson & Feather, 1966). Such proactive behaviors are consistent with early conceptualizations of FSB (Ashford & Cummings, 1983) and contribute to employees assigning meaning to their work experiences (Vandenberghe et al., 2021). Accordingly, this study's third hypothesis examines the effect of FSB on job performance.

H3: FSB has a positive and significant effect on job performance

Quality of Feedback, Feedback-seeking Behavior, and Job Performance

Feedback provides employees with information to regulate behavior and achieve work objectives. Feedback-seeking behavior (FSB) enhances job performance by supplying technical, role-specific, and evaluative insights, helping employees perform tasks effectively and meet expectations. In the absence of sufficient guidance, employees often seek feedback from supervisors to reduce role ambiguity and organizational uncertainty. FSB is also linked to creative performance, as it facilitates access to diverse information sources (Lam et al., 2017). Feedback quality significantly influences FSB by enhancing perceived feedback utility (Whitaker & Levy, 2012). FSB subsequently affects task performance and organizational citizenship behavior through the mediating role of role clarity. Drawing on implicit person theory (Heslin et al., 2005), uncertainty reduction, and Korman's motivation theory (Korman, 2012), research shows that high-quality feedback strengthens FSB and indirectly improves task performance by engaging both self-enhancement and self-protective motivational systems (Whitaker & Levy, 2012). While FSB is central to performance management and can improve individual outcomes (Rabbani & Alavi, 2023), some studies question its direct effect on performance (Anseel et al., 2015). Therefore, this study further investigates the relationships between feedback quality, FSB, and job performance by proposing its fourth hypothesis.

H4: Feedback-seeking behavior has a mediating role in the relation between feedback quality and job performance.

Gender Similarity

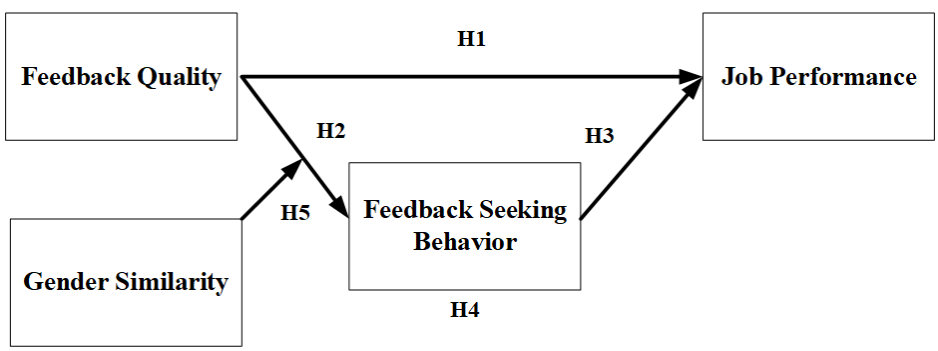
Similarity-attraction theory (Byrne, 1971) posits that individuals with similar characteristics are less likely to experience discomfort or conflict during interactions, fostering trust, credibility, and smoother communication. Such similarity enhances mutual understanding and the perceived value of feedback. Froehlich and Segers (2021) found that similarity among employees shapes feedback-seeking networks and, in turn, influences employability, suggesting that feedback-seeking behavior (FSB) is also affected by these dynamics. According to a meta-analysis by Anseel et al. (2015), FSB is especially beneficial for younger or less experienced employees, whereas organizational tenure, job tenure, and age correlate negatively with it. Individual factors such as learning orientation, external

feedback propensity, self-efficacy, and exposure to credible or positive feedback increase FSB. Situational elements, including transformational leadership and high-quality relationships, also serve as motivators (Anseel et al., 2015). Contextual moderators have been examined as well. Nae et al. (2015) reported that trust in supervisors does not moderate the FSB-performance link but interacts with feedback quality. Moreover, a feedback-seeking culture enhances the effect of positive feedback on task performance, with alignment between culture and practice yielding the best outcomes (Evans & Dobrosielska, 2021). Froehlich and Segers (2021) further noted that employees tend to seek feedback from colleagues and supervisors sharing similar age, tenure, role, or gender, with gender similarity positively associated with occupational expertise. Gender differences in feedback behavior also appear relevant: women often favor affiliative and indirect negotiation styles and adopt participative leadership, whereas men tend to favor directive approaches. Women also tend to exhibit higher social competence and interpersonal awareness (Lizzio et al., 2003). Based on these findings, this study hypothesizes that gender, particularly gender similarity, moderates the relationship between feedback quality and FSB.

H5: Gender similarity moderates the relation between feedback quality and employee feedback-seeking behavior.

Figure 1 depicts the conceptual model of this research based on the hypotheses presented in this section.

Figure 1: Research conceptual model



Source: Authors

Research Method

Study 1

Sample and Data Collection

The purpose of this study was to examine the relations between FQ, FSB, and JP in employees in the Energy industry across Tehran, Khozestan, and Bushehr, Iran. As mentioned in the introduction, an attempt has been made to ensure that the organizations under study in both selected industries are examples of entrepreneurial organizations and exhibit entrepreneurial behaviors. A postal survey was conducted to collect information from Iranian oil firms using an anonymous self-report questionnaire. It should be noted that the principle of confidentiality was respected, and respondents gave informed consent. To collect data from firms in different cities, 249 questionnaires were distributed, each accompanied by an explanatory letter and a return envelope. A pre-test with 30 participants was conducted. After removing 32 incomplete responses, 217 valid questionnaires were retained, yielding an 87% response rate. The sample consisted predominantly of men (84%), with participants aged 22–64 years, an average tenure of 14 years, and 94% having education beyond secondary school. Data analysis employed structural equation modeling (SEM) using LISREL 8.8 in two stages: first, assessing convergent validity; and second, testing the hypotheses. Measurement models for latent variables were examined via confirmatory factor analysis (CFA), followed by structural modeling and mediation analysis.

Questionnaire Measures

Independent variables: Feedback Quality (FQ)

Feedback Quality Questionnaire (FQQ-12, Strijobs, Pat-EI & Narcis, 2010) was used. The questionnaire includes sub-scales for fairness (FAIR) (e.g., I would be satisfied with this feedback), usefulness (USE) (e.g., I would consider this helpful feedback), acceptance (ACCEPT) (e.g., I would accept this feedback), and willingness to improve (WI) (e.g., I would be willing to improve my performance). Responses ranged from 1 = strongly disagree to 5 = strongly agree.

Mediating Variable: Feedback Seeking Behaviors (FSB)

We use the FSB with the Feedback Seeking Behaviors Questionnaire (FSBQ-7, Ashford, 1986) scale as the basis of measurement. This scale includes three sub-dimensions: "frequency of monitoring (FOM)" (e.g., how often do you compare your performance with others?) and "Frequency of inquiry (FOI)" (e.g., seek information from your co-workers about your work performance). The measuring items utilize a five-point Likert scale (1 = Never, 5 = Always).

Moderator Variable: Gender Similarity

Gender similarity between the feedback giver and the feedback receiver is measured by asking the employee's gender, as well as the employee's direct manager or supervisor.

Dependent Variable: Job Performance (JP)

JP was measured using the Job Performance Questionnaire (JPQ-10) developed by Koopmans et al. (2013). The scale was formed in terms of a Five-point response option from 1 = strongly disagree to 5 = strongly agree. It was initially used to measure individuals' task accomplishments, update their knowledge and skills, and respond to challenges. This job performance scale was based on participants' self-reports. Sample statements include 'I manage to plan my work so it gets done on time,' 'I will work to update my job skills,' and 'I take on challenging tasks if I can.'

Results

Table 1 presents the means, standard deviations, and bivariate correlations of the study constructs. As expected, the bivariate correlations were consistent with the proposed relations.

Table 1: Means, standard deviations, internal consistencies, and intercorrelations

Variables	M	SD	Cronbach's α	1	2	3
FQ	3.95	0.60	0.79	1		
FSB	4.01	0.48	0.83	0.63**	1	
JP	4.10	0.39	0.70	0.40**	0.55**	1

*Note: **1% levels*

Source: Authors' calculation

Convergent Validity

This study uses the Convergent Validity for research scales. Three procedures have been proposed by Fornell and Larcker (1981) to evaluate the convergent validity of the research model, namely reliability of measures, construct composite reliability, and average variance extracted (AVE). According to Hair et al. (2006), a factor loading of 0.7 indicates that the validity of an item is acceptable. For the following index of convergent validity, AVE, according to Segars (1997), is considered adequate if the AVE is 0.5 or higher. This study uses Cronbach's alpha rather than composite reliability; it is considered adequate if Cronbach's alpha is 0.7 or higher (see Table 2).

Table 2: Results of convergent validity

Construct	Measure	Factor loading (>.70)	AVE (>.50)	Cronbach alpha (>.70)
FSB			0.59	0.79
	Supervision	0.7		
	Search	0.82		
FQ			0.68	0.83
	Fair	0.74		
	Use	0.73		
	Accept	0.76		
	Improve	0.7		
JP			0.54	0.7
	Task	0.71		
	Skill	0.74		
	Challenge	0.7		

Source: Authors' calculation

To evaluate the hypothesized model's fit, a two-step approach was used. First, Confirmatory Factor Analysis (CFA) assessed the relationship between observed and latent variables. Model fit was tested using recommended indices - χ^2, df, RMSEA, GFI, AGFI, NFI, and CFI-following Kline's (1998) guidelines, with RMSEA < 0.08, $\chi^2/df \leq 3$, and GFI, AGFI,

NFI, and CFI ≥ 0.90 indicating acceptable fit (Joreskog & Sorbom, 1996). Results (Table 3) confirmed that all fit indices were within acceptable thresholds, demonstrating the model's adequacy in explaining structural relationships.

Table 3: Measurement model fitting test

Measurement Model	χ2	Df	RMSEA (<0/08)	GFI (>0/90)	AGFI (>0/90)	NFI (>0/90)	CFI (>0/90)
FQ	17.34	6	0.046	0.93	0.90	0.90	0.91
FSB	4.78	2	0.052	0.97	0.91	0.95	0.96
JP	11.35	5	0.031	0.99	0.97	1.00	1.00

Note: All χ2, p < .001.

Source: Authors' calculation

Table 4: Results of hypothesis testing

Hypotheses	Standardized coefficient	*T* value	Result
FQ → JP	0.32	2.06	Supported**
FQ → FSB	0.83	7.95	Supported**
FSB → JP	0.80	3.40	Supported**
χ2	96.04		
Df	34		
χ2/df (<3)	2.82		
RMSEA (<0/08)	0.048		
GFI (>0/90)	0.94		
AGFI (>0/90)	0.90		
NFI (>0/90)	0.98		
CFI (>0/90)	0.96		

*Note: ** P < 0.01. RMSEA root mean square error of approximation, GFI goodness-of-fit index, AGFI adjusted goodness-of-fit index, NFI Normed Fit Index, CFI Comparative Fit Index.*

Source: Authors' calculation

At the end of the analysis, the Chi-square measurement was found to be 96.04, and the degree of freedom (df) was 34 (/df = 2.82; p < 0.01); the

obtained results are: RMSEA = 0.048, GFI = 0.94, AGFI = 0.90, NFI = 0.98 and CFI = 0.96. Hypothesis 1 stated that FQ has a positive and significant effect on JP ($t = 2.06$; $p < 0.01$). Hypothesis 2 stated that FQ has a positive and significant effect on FSB ($t = 7.95$; $p < 0.01$). Hypothesis 3 stated that FSB has a positive and significant effect on JP ($t = 3.40$; $p < 0.01$). So, the FQ has a positive and significant effect on FSB, and FSB is a mediator of the relation between FQ and JP, as demonstrated by the analysis results (H4). The increase in the FQ positively affects his/her FSB and JP. According to Table 4, H1, H2, and H3 hypotheses were supported.

With respect to the mediating role of FSB, the FQ significantly and positively influences JP ($\beta = 0.43$, $p < 0.05$). FQ significantly and positively influences FSB ($\beta = 0.84$, $p < 0.05$). The study also tested the coefficient of FSB on JP ($\beta = 0.32$, $p < 0.05$). To determine whether FSB partially mediates the influence of the FQ on JP, we employed the Sobel test (Sobel test = 2.85, $p < .001$, Table 6) and found that H4, i.e., the mediating role of FSB, was supported. Based on the above, the direct effect of the FQ on JP is 0.52, and the indirect effect is 0.29. Thus, the total effect is 0.61 (see Table 5).

Table 5: Sobel test, direct, indirect, and total effects

Mediating path	**Sobel test**	**p-value**	**Indirect effect**	**Direct effect**	**Total effect**
FQ → FSB→ JP	2.85	< 0.001	0.29	0.52	0.61

Source: Authors' calculation

To examine the modere role of gender similarity, regression analysis was performed using SPSS. Gender similarity was calculated from employee and direct manager genders, and z-scores were computed for feedback quality and feedback-seeking behavior to standardize ranges. An interaction term (feedback quality × gender similarity) was created as the moderator variable. In the regression model, feedback quality, gender similarity, and the interaction term were independent variables, with feedback-seeking behavior as the dependent variable. Table 6 presents the regression results.

Table 6: Regression analysis results to test hypothesis 5

Construct	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value
	Beta	Std. Error	Beta		
(Constant)	-0.1	0.069		-1.451	0.148
FQ (z-score)	0.544	0.075	0.544	7.211	0.000
Gender_Similarity (GS)	0.191	0.096	0.096	1.994	0.047
Interaction (FQ*GS)	-0.051	0.098	-0.04	-0.525	0.6

Note: Dependent variable: FSB (z-score)
Source: Authors' calculation

The results provided in Table 6 indicate that H5, which is the moderating role of gender similarity, is rejected, and gender similarity was disapproved as the moderator since the significance of this variable is 0.6 (p-value = 0.6 > 0.05). However, the p-value of gender similarity is 0.047, indicating a significant effect of gender similarity on FSB.

Study 2

Sample and Data Collection

The purpose of this study was to examine the relations between FQ, FSB, and JP in employees in the Banking industry across Tehran, Iran. A postal survey was conducted to collect information from Iranian banks using an anonymous self-report questionnaire. As mentioned in the previous section, in this sample, participants also provided informed consent, and the responses were anonymous. To collect data from banks, 400 questionnaires were distributed, each including an explanatory letter and a return envelope. A pre-test with 30 participants was conducted. After removing 32 incomplete responses, 322 valid questionnaires remained, yielding an 80.5% response rate. The sample consisted of 64% men and 36% women, aged 22–59 years, with an average tenure of 19 years, and 97% held an education beyond secondary school. Data were analyzed using structural equation modeling (SEM) via LISREL 8.8 in two stages: first, convergent validity testing; then, hypothesis testing through confirmatory factor analysis (CFA), structural modeling, and mediation analysis.

Questionnaire Measures

Independent Variables: Feedback Quality (FQ)

Feedback Quality Questionnaire (FQQ-12, Strijobs, Pat-EI & Narcis, 2010) was used. The questionnaire includes sub-scales for fairness (FAIR) (e.g., I would be satisfied with this feedback), usefulness (USE) (e.g., I would consider this helpful feedback), acceptance (ACCEPT) (e.g., I would accept this feedback), and willingness to improve (WI) (e.g., I would be willing to improve my performance). Responses ranged from 1 = strongly disagree to 5 = strongly agree.

Mediating Variable: Feedback Seeking Behaviors (FSB)

We use the FSB with the Feedback Seeking Behaviors Questionnaire (FSBQ-7, Ashford, 1986) scale as the basis of measurement. This scale includes three sub-dimensions: "frequency of monitoring (FOM)" (e.g., how often do you compare your performance with others?") and "Frequency of inquiry (FOI)" (e.g., seek information from your co-workers about your work performance). The measuring items utilize a five-point Likert scale (1 = Never, 5 = Always).

Moderator Variable: Gender Similarity

Gender similarity between the feedback giver and the feedback receiver is measured by asking the employee's gender, as well as the employee's direct manager or supervisor.

Dependent Variable: Job Performance (JP)

JP was measured using the Job Performance Questionnaire (JPQ-10) developed by Koopmans et al. (2013). The scale was formed in terms of a Five-point response option from 1 = strongly disagree to 5 = strongly agree. It was initially used to measure individuals' task accomplishments, update their knowledge and skills, and conform to challenges. This job performance scale was based on participants' self-reports. Sample statements include 'I manage to plan my work so it gets done on time,' 'I will work to update my job skills,' and 'I take on challenging tasks if I can.'

Results

The table presented shows the means, standard deviations, and bivariate correlations of the study constructs.

Table 7: Means, standard deviations, internal consistencies, and intercorrelations

Variables	M	SD	Cronbach's α	1	2	3
FQ	3.69	0.71	0.81	1		
FSB	3.62	0.70	0.88	0.69**	1	
JP	4.06	0.46	0.76	0.43**	0.58**	1

*Note: **1% levels*

Source: Authors' calculation

Convergent Validity

This study uses the Convergent Validity for research scales. Three procedures have been proposed by Fornell and Larcker (1981) to evaluate the convergent validity of the research model, namely, reliability of measures, construct composite reliability, and average variance extracted (AVE). According to Hair et al. (2006), a factor loading of 0.7 indicates that the validity of an item is acceptable. For the following index of convergent validity, AVE, according to Segars (1997), is considered adequate if the AVE is 0.5 or higher. This study uses Cronbach's alpha rather than composite reliability; it is considered adequate if Cronbach's alpha is 0.7 or higher (see Table 8).

Table 8: Results of convergent validity

Construct	Measure	Factor loading (>.70)	AVE (>.50)	Cronbach alpha (>.70)
FSB			0.62	0.81
	Supervision	0.73		
	Search	0.85		
FQ			0.74	0.88
	Fair	0.79		
	Use	0.77		
	Accept	0.81		

Construct	Measure	Factor loading (>.70)	AVE (>.50)	Cronbach alpha (>.70)
JP	Improve	0.72	0.57	0.76
	Task	0.73		
	Skill	0.76		
	Challenge	0.72		

Source: Authors' calculation

To test the fit of the hypothesized model, the two-step approach was followed. First, to confirm that the observed variables were satisfactorily related to their respective latent variables, Confirmatory Factor Analysis (CFA), as one of the data analysis procedures, was applied to the measurement model. To test the fit of the measurement and structural models, Kline (1998) suggested that there should be a minimum of four tests that are acceptable and compatible with the model fit. These tests include chi-square ($\chi 2$), degrees of freedom (df), Root Mean Square Error of Approximation (RMSEA), Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed fit index (NFI), and Comparative fit index (CFI). The results of this study are presented in Table 3. Hence, it indicates that the overall structure of the model can properly explain the structural relation of the data in this study.

In fit indices measures, RMSEA < 0.08 and $\chi 2 \leq 3$ of ideal values indicate a perfect fit. Likewise, GFI, AGFI, NFI, and CFI values of 0.9–0.95 or greater are considered indicative of acceptable overall fit (Joreskog & Sorbom, 1996). In this study, the values pertaining to fit indices have been at acceptable levels (see Table 9).

Table 9: Measurement model fitting test

Measurement Model	$\chi 2$	df	RMSEA (<0/08)	GFI (>0/90)	AGFI (>0/90)	NFI (>0/90)	CFI (>0/90)
FQ	14.19	7	0.039	0.95	0.91	0.91	0.93
FSB	3.96	2	0.051	0.99	0.97	0.97	0.99
JP	7.94	4	0.042	0.96	0.94	0.90	0.92

Note. All $\chi 2$, $p < .001$.

Source: Authors' calculation

At the end of the analysis, the Chi-square measurement was found to be 84.98, and the degree of freedom (df) was 41 (/df = 2.07; $p < 0.01$); the obtained results are: RMSEA = 0.038, GFI = 0.97, AGFI = 0.93, NFI = 0.99, and CFI = 0.95. Hypothesis 1 stated that FQ has a positive and significant effect on JP ($t = 3.70$; $p < 0.01$). Hypothesis 2 stated that FQ has a positive and significant effect on FSB ($t = 9.14$; $p < 0.01$). Hypothesis 3 stated that FSB has a positive and significant effect on JP ($t = 2.12$; $p < 0.01$). So, the FQ has a positive and significant effect on FSB, and FSB is a mediator of the relation between FQ and JP, as demonstrated by the analysis results (H4). The increase in the FQ positively affects his/her FSB and JP. According to Table 10, H1, H2, and H3 hypotheses were supported.

Table 10: Results of hypotheses testing

Hypotheses	**Standardized coefficient**	***T* value**	**Result**
FQ → JP	0.39	3.70	Supported**
FQ → FSB	0.69	9.14	Supported**
FSB → JP	0.28	2.12	Supported**
$\chi 2$		84.98	
Df		41	
$\chi 2$/df (<3)		1.85	
RMSEA (<0/08)		0.038	
GFI (>0/90)		0.97	
AGFI (>0/90)		0.93	
NFI (>0/90)		0.99	
CFI (>0/90)		0.95	

*** P < 0.01. RMSEA root mean square error of approximation, GFI goodness-of-fit index, AGFI adjusted goodness-of-fit index, NFI Normed Fit Index, CFI Comparative Fit Index.*

Results of Hypotheses Testing

With respect to the mediating role of FSB, the FQ significantly and positively influences JP ($\beta = 0.46$, $p < 0.05$). FQ significantly and positively influences FSB ($\beta = 0.89$, $p < 0.05$). The study also tested the coefficient of FSB on JP ($\beta = 0.34$, $p < 0.05$). To determine whether FSB partially mediates the influence of the FQ on JP, we employed the Sobel test (Sobel

test = 3.42, p < .001, Table 11) and found that H4, i.e., the mediating role of FSB, was supported. Based on the above, the direct effect of the FQ on JP is 0.57, and the indirect effect is 0.33. Thus, the total effect is 0.64 (see Table 11).

Table 11: Sobel test, direct, indirect, and total effects

Mediating path	Sobel test	p-value	Indirect effect	Direct effect	Total effect
FQ → FSB→ JP	3.42	< 0.001	0.33	0.57	0.64

Source: Authors' calculation

To assess the moderating role of gender similarity, regression analysis was performed in SPSS. Gender similarity was derived from employee and direct manager genders, and z-scores were calculated for feedback quality and feedback-seeking behavior to standardize variable ranges. An interaction term (feedback quality × gender similarity) was generated as the moderator. In the regression model, feedback quality, gender similarity, and the interaction term served as independent variables, with feedback-seeking behavior as the dependent variable. Table 12 reports the results of this analysis.

Table 12: Regression analysis results to test hypothesis 5

Construct	Unstandardized Coefficients		Standardized Coefficients	t-value	p-value
	Beta	Std. Error	Beta		
(Constant)	-0.345	0.149		-2.305	0.022
FQ (z-score)	0.550	0.106	0.550	5.170	0.000
Gender_Similarity (GS)	0.437	0.162	0.170	2.693	0.008
Interaction (FQ*GS)	-0.09	0.128	-0.071	-0.706	0.481

Note: Dependent variable: FSB (z-score)

Source: Authors' calculation

The results provided in Table 12 indicate that H5, which is the moderating role of gender similarity, is rejected, and gender similarity was disapproved as the moderator since the significance of this variable is 0.481 (p-value = 0.481 > 0.05). However, the p-value of gender similarity is 0.008, indicating a significant effect of gender similarity on FSB.

Discussion

This study investigated the effect of feedback quality on job performance, considering the mediating role of feedback-seeking behavior (FSB) and the moderating role of gender similarity. Two samples from Iran's oil and petrochemical and banking industries were selected due to differences in gender composition and organizational culture; the former had predominantly male managers and employees, while the latter had greater gender diversity. The results confirmed the first hypothesis: feedback quality positively affects job performance in both industries. High-quality feedback—characterized by fairness, timeliness, usefulness, ease of acceptance, and a developmental focus-enhanced employees' task performance, skill development, and ability to address challenges, aligning with prior research (Ashford & Cummings, 1983; Drouvelis & Paiardini, 2022; Nae et al., 2015). The second hypothesis was also supported: feedback quality positively influences FSB. Employees perceiving feedback as fair, useful, and oriented toward improvement were more likely to seek feedback from multiple sources, fostering a feedback culture (Whitaker & Levy, 2012).

The third hypothesis was confirmed: FSB positively impacts job performance by improving task execution, knowledge acquisition, and adaptability, consistent with earlier findings (Rabbani & Alavi, 2023; Lam et al., 2017). The fourth hypothesis demonstrated that FSB mediates the relationship between feedback quality and job performance. Employees receiving high-quality feedback engaged more in feedback-seeking, which in turn enhanced performance, regardless of industry (Lam et al., 2017; Whitaker & Levy, 2012). However, the moderating role of gender similarity in the feedback quality–FSB link was not supported. While it did not moderate the relationship, gender similarity had a direct positive effect on FSB, with employees more inclined to seek feedback from managers of the same gender - likely due to cultural factors.

Theoretical and Practical Implications

This study, grounded in Shannon's information theory (1948), provides a clearer picture of how feedback quality, feedback-seeking behavior (FSB), job performance, and gender similarity interact in organizational settings. It addresses the gap noted by Nae et al. (2015) regarding the limited empirical evidence on moderators in the FSB-performance relationship. By incorporating gender similarity into the conceptual model based on gender similarity attraction theory, our findings help explain how the feedback process functions and how gender dynamics can shape employees' willingness to seek feedback and ultimately their job performance. In addition to the theoretical implications, this study has practical implications for two important audiences: managers and human resource practitioners.

Managers can enhance employee performance by providing high-quality, constructive, and timely feedback, while fostering an environment where employees feel comfortable seeking it. Implementing regular feedback sessions, promoting open communication, and encouraging employees to seek feedback from supervisors and peers proactively all support professional growth and improved performance. HR professionals can strengthen organizational feedback practices by building a feedback-seeking culture centered on continuous learning and improvement. While gender similarity does not moderate the link between feedback and FSB, its positive effect on FSB suggests that organizations can benefit from training programs that help employees interpret and engage with feedback from supervisors of different genders. Additionally, evaluating feedback processes through surveys or focus groups provides insights for refining these systems and maximizing their impact on organizational performance.

Like many other studies, this research is not without limitations. One key limitation is the potential bias in self-report questionnaires, which may reflect self-enhancing tendencies rather than objective data. Future research is encouraged to use multiple sources of performance appraisal, such as formal performance records or supervisor evaluations, to mitigate this problem. Another limitation relates to the cross-sectional design, which limits the ability to infer causality between variables such as feedback quality, feedback-seeking behavior (FSB), and job performance. Future studies should consider longitudinal designs with data collected at multiple time points to establish stronger causal relationships. The sampling strategy also presents limitations. The data were collected exclusively from the banking, oil, and petrochemical industries of Iran, which may reduce the

generalizability of the findings to other sectors and cultural contexts. Furthermore, the gender composition of the sample was unbalanced, reflecting the patriarchal nature of the manufacturing and energy sectors compared to the service sector. Typically, the majority of employees in the energy industry in Iran, especially in the operational sector, are men. This is not the case in the banking industry. This gender imbalance and sector-specificity may limit the applicability of the results to more gender-diverse or demographically diverse industries. As Sally de Luc and Summer (2000) pointed out, cultural values such as power distance affect employees' trust in supervisor feedback, and the cultural context of Iran is different from Western countries (Hofstede, 2001). Therefore, future research should replicate the current model using gender-balanced and more diverse samples in different cultural settings or examine cultural values as a moderator.

Conclusion

This study demonstrates that high-quality feedback improves job performance by encouraging active feedback-seeking, emphasizing the value of constructive and actionable input within supportive environments. While gender similarity did not moderate the relationship, it was associated with higher trust and communication, indirectly enhancing feedback effectiveness. The findings suggest that organizations should design feedback systems prioritizing quality, openness, and inclusivity, supported by training on gender dynamics. Future research should explore additional moderating factors and adopt longitudinal designs to clarify causal relationships. Cultivating a culture of quality feedback and proactive feedback-seeking can substantially boost performance and organizational success.

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ORIGINAL SCIENTIFIC PAPER

Assessing Performance of Women Home-Based Businesses from the Low-Income Group: Testing Multiple Mediator Model

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A B S T R A C T

A home-based business is a micro-business carried out more by women than men to increase personal and family income. The lack of attention given by past researchers has resulted in less-known information about the performance of these entrepreneurs, even though this activity has been around for a long time, and many women are engaged in it. This study examines the determinants of sustainable

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performance in women's home-based businesses to fill this gap. The second objective is to investigate the multiple mediating effects of digital competencies and Artificial Intelligence (AI) adoption towards the connections between entrepreneurial resources (i.e., access to finance, access to entrepreneurial education, and access to networking) and sustainable business performance. The data collection approach used a questionnaire directed to 300 low-income women home-based entrepreneurs in the Central Zone, Malaysia. The Structural Equation Modelling (SEM) analysis showed that digital competency and AI adoption have significant effects and mediate the relationship between entrepreneurial resources and sustainable business performance. This study provides an overview of the resources that can contribute to the business's abilities, which leads to a competitive advantage by applying physical and non-physical resources.

KEYWORDS: *entrepreneurial resources, artificial intelligence (AI) adoption, digital competencies, sustainable business performance*

Introduction

Permitting women entrepreneurs from low-income groups could support zero poverty (SDG1), gender equality (SDG5), and reduce inequality (SDG10), which are central elements of human rights. With half of the world's population being women, it is significant for this group to be empowered (Bilal et al., 2023). These should not be a topic of discussion among women's empowerment groups. Therefore, action must be taken, augmented by the government's commitment to enact policies that empower women and low-income groups' accessibility to equal opportunities in employment and economic expansion (Muthukrishnan & Bhattacharyya, 2024; Pulka et al., 2021).

Many women nowadays have entered the field of online business. Women entrepreneurs play a vital role in fostering economic growth and promoting gender equality (Kutlu & Ngoasong, 2024). The Department of Statistics of Malaysia disclosed that the population of Malaysia is 34.0 million people in 2024, with a male population of 17.8 million and a female population of 16.1 million. Overall, the sex ratio for the citizen population is 103 males for every 100 females (Department of Statistics Malaysia, 2024).

In Malaysia, progress has been made toward gender-related Sustainable Development Goals, particularly Goal 5 on gender equality (Xu et al., 2024), with government initiatives supporting women's entrepreneurship through agencies (Pulka et al., 2021), such as the Community Development

Department (KEMAS), the Federal Land Development Authority (FELDA), the Rubber Industry Smallholders Development Authority (RISDA), and various regional development boards. However, Malaysia ranked 114th of 146 in the 2024 WEF Gender Gap Index, a drop of 12 places from 2023 (World Economic Forum, 2024). This underscores the need for concrete policies ensuring equal opportunities for women (Ognjenović, 2023; Ong et al., 2021).

The ascent of digital entrepreneurship has created newfound opportunities for women to participate in business, specifically through online platforms and social media. Online businesses have expanded traction as they are cost-efficient, support broader market reach, and offer flexible working conditions (Kabbara, 2025). Despite this growth, only a small percentage of women entrepreneurs achieve long-term success in online businesses (Mohd Noor et al., 2024). Many small businesses in Malaysia are still doubtful to accept digital technologies due to inadequate knowledge, a lack of training, and an inclination toward traditional business methods (AlKoliby et al., 2024; Omrani et al., 2022).

These challenges can cause enterprise financial and hiring difficulties (AlKoliby et al., 2024). Many small business owners struggle to find financing to support their business' progress (Manzoor et al., 2021; Pulka et al., 2021). Research suggests that overcoming these barriers enhances resilience and improves business performance (Mohd Noor et al., 2024). Women entrepreneurs who successfully navigate business challenges demonstrate strong expertise, technological adaptability, sufficient financial capital, and receive strong institutional support (AlKoliby et al., 2024; Gerhart & Feng, 2021; Ioannou & Retalis, 2025; Kohda et al., 2023).

Entrepreneurial resources, such as financial capital, skills, knowledge, and networks, are vital for the success and growth of small businesses (Amadasun & Mutezo, 2022; Manzoor et al., 2021). Evidence shows these resources positively influence business performance and lead to better entrepreneurial endeavors (Barney et al., 2021; Sitaridis & Kitsios, 2024; Saoula et al., 2025). This study explores the impact of entrepreneurial resources, AI adoption, and digital competencies on the sustainable performance of home-based women entrepreneurs from low-income groups. It examines whether digital competencies and AI adoption mediate this relationship.

This study focuses on the context of women's home-based businesses from low-income groups. Despite their contributions to the economy, home-

based businesses are often overlooked in policy and underrepresented in academic research (Hamidi et al., 2023; Shahid et al., 2022). Most home-based businesses in Malaysia are classified as micro enterprises (registered) or small businesses operating in the informal sector (unregistered). The motivation for this is to generate income or get job satisfaction. In Malaysia, there is a lack of specific policies to cater to entrepreneurs in the informal economy, and even the government seems to neglect their current growth and development. In the context of gender, home-based business is more often undertaken by women than men and those from the low-income group (Jaaffar et al., 2024). Aware of the importance of home-based businesses in achieving sustainable development goals (i.e., SDG 1, SDG5, and SDG10), only a few studies, such as Mohd Noor et al. (2024), Noor et al. (2025), and Wan Ali and Ali Othman (2025), have explained the performance of home-based businesses in Malaysia.

Wan Ali and Ali Othman (2025) found that over half of Malaysia's home-based women entrepreneurs do not concentrate on a single business, often starting new ventures before the previous ones are established. Despite their significant socio-economic role, few studies address specific resources for such businesses. Noor et al. (2024) note that low-income women entrepreneurs often lack strong management skills and ICT exposure, leading to traditional business practices. Strengthening entrepreneurial skills is crucial for enhancing competitiveness and ensuring sustainability in the digital economy.

Literature Review

Resource-Based View (RBV) and Sustainable Business Performance

Most businesses have executed a sustainability structure to gauge their financial, social, and environmental performance, recognized as the Triple Bottom Line (TBL) (Telukdarie & Munsamy, 2024). The term TBL was devised in 1990 by business specialist John Elkington, who states that organizational performance should be measured based on economic, environmental, and social aspects (Telukdarie & Munsamy, 2024). Moreover, TBL assumes that organizational sustainability can only succeed when an equilibrium connects economic, environmental, and social elements. Preceding studies have shown that the environmental dimension should converge on the influence of the organization on living and non-

living systems such as ecosystems, soil, air, and water (Pangarso et al., 2022). It is attached to efficiently using energy resources, lowering greenhouse gas emissions, and curtailing the ecological footprint. On the other hand, the economic dimension refers to the organization's outlook to construct value and to balance costs and revenues in the production and allocation of goods and services (Zaharia & Zaharia, 2021). Finally, the social dimension is indicated by employees, customers, and the surrounding community. Since customers are also involved in society, improving customer welfare also improves the welfare of the surrounding community. Social sustainability implies the actual achievement of an organization in improving and insisting on the quality of life without neglecting social and environmental aspects (Zaharia & Zaharia, 2021).

A resource-based view (RBV) framework is used in strategic management to evaluate and pinpoint the strategic assets that a company might use to gain a long-term competitive edge and sustainable performance (Barney et al., 2021). It highlights that an organization’s internal resources and competencies are the focal factors that determine the performance and strategic success of the organization. Key constituents of the RBV include the assets, capabilities, activities, attributes, information, and knowledge retained by an organization (Gerhart & Feng, 2021). Resources may be classified as intangible, such as intellectual property and brand reputation, or physical, containing buildings and equipment (Amadasun & Mutezo, 2022; Ioannou & Retalis, 2025; Manzoor et al., 2021).

Additionally, the RBV is a way to look at gender equality in the digital economy. It centers on using resources and skills to create equal opportunities and lower gender gaps (Sitaridis & Kitsios, 2024; Saoula et al., 2025). The RBV emphasizes the significance of giving women equal access to vital resources to close the gender gap in the digital economy. These resources include human capital (i.e., skills, education, and training), technology resources (i.e., digital tools, internet connectivity, and platforms), financial resources (i.e., funding, credit, and investment opportunities), and social and cultural resources (i.e., networks, mentorship, and role models) (Barney et al., 2021; Ioannou & Retalis, 2025; Kohda et al., 2023).

Entrepreneurial Resources and Sustainable Business Performance

Financial resources are essential in starting a business, as they are the basis for funding and capital (Amadasun & Mutezo, 2022; Saoula et al., 2025). Financial resources can be obtained through various resources such as personal accounts of the company founder, loans and credits from financial institutions, and assistance from family, friends, or government agencies. Government support schemes are crucial for small businesses (Pulka et al., 2021), and Manzoor et al. (2021) found that financial capital and impetus strongly correlate with the success of women entrepreneurs. In line with a study by Khan et al. (2021), microfinancing is among the fundamental strengths of a group of small businesses.

Next, a person must have knowledge linked to entrepreneurship to undertake entrepreneurship (Kohda et al., 2023). This is because entrepreneurship education can help a person learn and comprehend how to operate a business more effectively (Sitaridis & Kitsios, 2024). Entrepreneurship education can also develop leadership characteristics, creativity, and innovation skills needed in business. Ioannou and Retalis (2025) noticed that the impact of education and learning outcomes obtained could indirectly improve the economy for small businesses by further developing product markets internationally. This is in line with a study by Saoula et al. (2025), which suggests that to meet economic development objectives, institutions have a role in delivering education and training opportunities, investing in infrastructure, or providing financial and non-financial assistance. Similarly, Marvel et al. (2025) found that empowerment and coaching from non-financial institutions showed positive outcomes for single-mother participants because they could develop their business skills.

Encouraging a great network is essential for entrepreneurs aiming to succeed in the global market (Abu-Rumman et al., 2021). In networking, the principle of "quality over quantity" is paramount. Prioritizing a small circle of meaningful connections is often more beneficial than amassing a vast list of contacts. Shared respect, joint goals, and genuine interests characterize high-quality interactions. Such relationships can offer deeper insights, concentrated support, and more significant prospects for partnership. Also, profound relationships are more likely to result in valuable exchanges, such as referrals or partnerships, which can be necessary for business growth (Pulka et al., 2021). By leveraging online platforms, entrepreneurs can

connect with mentors, investors, and partners who provide invaluable guidance and resources (Barney et al., 2021). Based on the above literature, the current study assumes:

H1: Entrepreneurial resources positively contribute to the sustainable performance of women's home-based businesses from low-income groups.

Mediation Role of Artificial Intelligence (AI) Adoption

AI adoption plays a central role in improving the sustainable performance of women's businesses by improving efficiency, enhancing decision-making, and supporting competitiveness (Kulkov, 2021). AI-powered tools such as automation software, chatbots, and predictive analytics streamline operations, decrease costs, and improve resource allocation, ultimately nurturing long-term business sustainability (Kanbach et al., 2024). By automating routine tasks and increasing workflow optimization, AI decreases operational inefficiencies and enhances business resilience despite market fluctuations. These technologies facilitate entrepreneurs to increase production, govern supply chains more effectively, and provide personalized customer experiences (Townsend, 2023). Beyond operational advances, AI adoption empowers women entrepreneurs by relieving the burden of repetitive tasks, allowing them to focus on strategic decision-making and innovation. Additionally, predictive analytics aid in demand forecasting and inventory management, minimizing waste and maximizing profitability (Crockett et al., 2021). Hence, we recommend the hypothesis:

H2: AI positively mediates the nexus between entrepreneurial resources and sustainable businesses from low-income groups.

Mediation Role of Digital Competencies

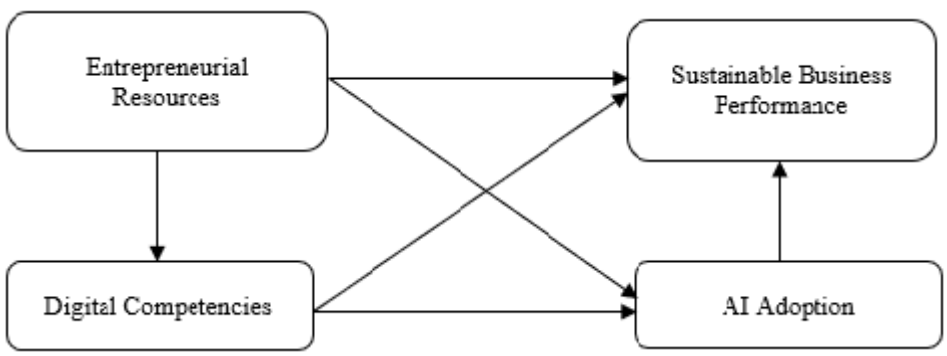
d'Ignazio et al. (2025) asserted that the existence of competencies is seen as an important agenda item in business management, other than in the field of education. He added that with the existence of competencies, an entrepreneur can work and continue sustaining in a globally competitive society. Entrepreneurs must master the technologies that suit their business and overcome potential cybersecurity and data privacy issues. In addition, there is a risk of a digital divide where entrepreneurs with limited access,

knowledge, and technology skills will be left behind (Khoo et al., 2024). Technology opens new opportunities, changes business management, and stimulates innovation. Therefore, a grasp of technology is an important aspect of the triumph of entrepreneurs in the digital era. One of the most important aspects of running an online business is letting people know that businesses exist in the vast digital world (Bachmann et al., 2024). Some digital competencies that need to be mastered include developing Search Engine Optimization (SEO) content, inbound marketing, pay-per-click (PPC), affiliate marketing, and native advertising (Sitaridis & Kitsios, 2024). Considering the proposition, we conjecture:

H3: Digital competencies positively mediate the nexus between entrepreneurial resources and sustainable businesses from low-income groups.

Figure 1 elucidates the model of the study.

Figure 1: Research model



Source: Authors' Creation

Methodology

This study uses a quantitative and survey research method to collect data. The population of this study is home-based women entrepreneurs. Previous examinations recommend that a minimum sample size of 100 to 200 samples be acceptable for structural equation modeling (SEM) (Hair et al., 2017). Hence, 300 responses were chosen, and 255 data samples were collected. The study sample collection is carried out using a multi-stage sampling. First, employing a purposive sampling, the study respondents are

women entrepreneurs of home-based businesses. Among the criteria used are: 1) local women home-based entrepreneurs in the Central Zone of Malaysia (i.e., Selangor and Kuala Lumpur), 2) operating in the informal sector (i.e., unregistered with the Companies Commission of Malaysia or any regulative bodies), 3) having at least one year of business experience, and 4) the low-income group. The low-income group in Malaysia is the Bottom 40 or B40, with an average monthly household income under Ringgit Malaysia (RM) of 4,850.

For the second stage, a convenience sampling technique is used. The researchers allocated a Google form questionnaire to several women entrepreneur groups' social media, such as Ibupreneur, Women of Will, Women Entrepreneur Network Association Malaysia (WENA), and Peniagawati. In Malaysia, since the business is run from home and there is no obligation to apply for a license, it is not officially categorized, and there is no official list of home-based businesses in Malaysia. Thus, convenience sampling allows research studies to be conducted reasonably and involves selecting participants based on accessibility and availability.

The study began by determining face validity. Three experts translated the original questionnaire twice using the back translation process. The first translation was done from the English version to the Malay version. Then, the questionnaire was translated back into English. Corresponding to the study's requirements and application, all the questions are altered from previous studies. Entrepreneurial resources contain three dimensions, namely, access to finance, access to entrepreneurial education, and access to networking. The 10-item scale was adapted from Anwar and Ali Shah (2020) and Duong (2022). Four items were designed from the research of Rubach and Lazarides (2021) to assess digital competencies. Artificial intelligence (AI) adoption measures used five-item scales adapted from Abrokwah-Larbi and Awuku-Larbi's (2024) study. Six items for sustainable business performance were taken from Agrawal et al. (2022) and Lee and Roh (2023). The Likert scale method from 1 to 5 was used to measure respondents' agreement level with the constructed items. The measurement of the items in this study is shown in the Appendix. The assessment method used is structural equation modeling (SEM) with IBM-SPSS-AMOS 28.0 software.

Results

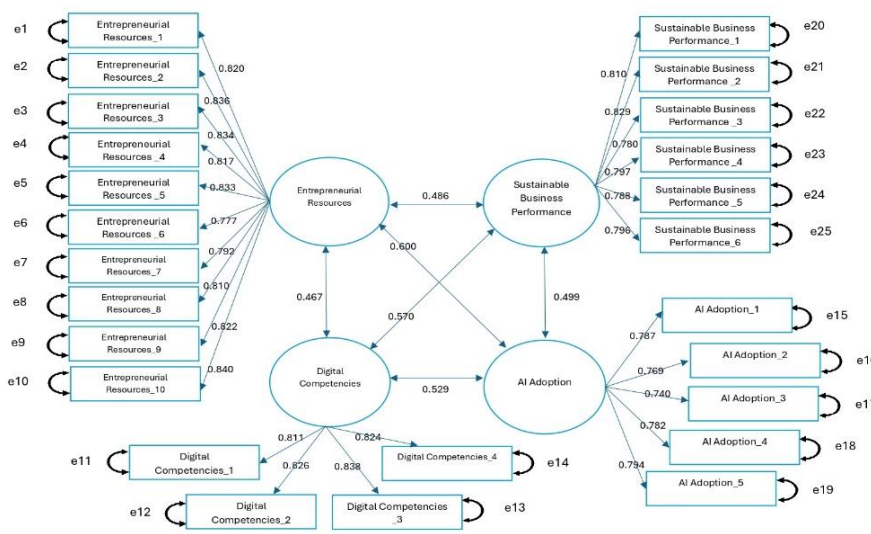
Demographic Profile

Out of 255 respondents, most are from the age group of 25 – 29 years (n=100, 39.2%). This is followed by 18–24 years (n=74, 29%), 35–40 years (n=40, 15.7%), 30–35 years (n=25, 9.8%), and 40 years and above (n=16, 6.3%). Most of the respondents also have academic qualifications at the secondary level, with 163 respondents (63.9%). This is followed by a Diploma or Foundation (n=44, 17.3%), a bachelor's degree (n=35,13.7%), a Graduate degree (MA or PhD) (n=2, 0.8%), and others (n=11, 4.3%). Then, most women entrepreneurs live in urban areas (n=168, 65.9%). This is followed by semi-urban (n=64, 25.1%) and rural areas (n=23, 9%). Finally, most entrepreneurs have operated their businesses for four to five years (n=218, 85.5%).

Confirmatory Factor Analysis (CFA)

Model fit can be determined with several indices. The Root Mean Square Error of Approximation (RMSEA) value must be less than 0.08.

Figure 2: CFA model



Source: Authors' Creation

Next, CMIN/DF less than 3.00 signifies an acceptable fit. The Comparative Fit Index (CFI), the Goodness of Fit Index (GFI), the Normed Fit Index (NFI), and the Tucker-Lewis index should be more than 0.90. The goodness of fit indices are produced as follows: 1) CFI=0.957, 2) GFI=0.949, 3) NFI=0.958, 4) TLI=0.950, 5) RMSEA=0.049, and 6) CMIN/DF=1.707. Figure 2 reveals the CFA model.

Validity and Reliability Tests

The validity test is performed with the AMOS application. If the item loading is less than 0.50, the item needs to be discarded from the model (Hair et al., 2010). As shown in Table 1, the items for each variable have achieved validity assumptions. For example, the loading factor value of the ER1 indicator is 0.820, which is greater than 0.50, so the ER1 indicator is declared valid. For the reliability test, two assumptions are used, including Composite Reliability (CR), which must be more than 0.70, and Average Variance Extracted (AVE), which must be more than 0.50 (Hair et al., 2010). As shown in Table 1, the AVE and CR values for Entrepreneurial Resources (AVE=0.669, CR=0.952), Digital Competencies (AVE=0.680, CR=0.894), AI Adoption (AVE=0.600, CR=0.882), and Sustainable Performance (AVE=0.640, CR=0.914) exceed the minimal requirement. Thus, the reliability assumption for each construct is achieved. Then, Cronbach's Alpha value is used to determine the internal consistency of the constructs. Based on Table 1, the range of Alpha values of Entrepreneurial Resources (α=0.840), Digital Competencies (α=0.850), AI Adoption (α=0.800), and Sustainable Performance (α=0.770) are above 0.60, which implies internal consistency (Nunnally & Bernstein, 1994).

Table 1: Item loadings, Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's Alpha Results

Variable	Items	Item Loadings	AVE	CR	α
Entrepreneurial Resources	ER1	0.820***	0.669	0.952	0.840
	ER2	0.836***			
	ER3	0.834***			
	ER4	0.817***			
	ER5	0.833***			
	ER6	0.777***			
	ER7	0.792***			

Variable	Items	Item Loadings	AVE	CR	α
	ER8	0.810***			
	ER9	0.822***			
	ER10	0.840***			
Digital Competencies	DC1	0.811***	0.680	0.894	0.850
	DC2	0.826***			
	DC3	0.838***			
	DC4	0.824***			
AI Adoption	AI1	0.787***	0.600	0.882	0.800
	AI2	0.769***			
	AI3	0.740***			
	AI4	0.782***			
	AI5	0.794***			
Sustainable Performance	SP1	0.810***	0.640	0.914	0.770
	SP2	0.829***			
	SP3	0.780***			
	SP4	0.797***			
	SP5	0.788***			
	SP6	0.796***			

Source: Authors' calculations

Discriminant Validity

Validity testing is a crucial step in any research that involves measuring variables. Research results cannot be trusted or used to make valid decisions without adequate validity. Discriminate validity quantifies how far a construct is distinctive from other constructs. The test relates the Average Variance Extracted (AVE) square root value with the association value between constructs (Fornell & Larcker, 1981). In Table 2, the square root value of AVE for Entrepreneurial Resources (√AVE=0.817), Digital Competencies (√AVE=0.824), AI Adoption (√AVE=0.774), and Sustainable Performance (√AVE=0.800) is higher than the value of the correlation between latent variables; this shows that the construct varies from other indicators. This also indicates that the measurement model of a construct is free from overlapping items.

Table 2: Discriminant Validity for the Variables

No.	Variable	1	2	3	4
1	Entrepreneurial Resources	**0.817**			
2	Digital Competencies	0.467**	**0.824**		
3	AI Adoption	0.600**	0.529**	**0.774**	
4	Sustainable Performance	0.486**	0.570**	0.499**	**0.800**

Note: Values in the diagonal show the square root of AVE

Source: Authors' calculations

Hypothesis Testing

From Table 3, the results showed entrepreneurial resources (β=0.425, p<0.001) significantly predict the dependent variable, sustainable business performance. Thus, H1 was accepted. This means the direct influence of entrepreneurial resources on sustainable performance amounts to 0.425, which means that entrepreneurial education positively influences sustainable performance by 42.5%. Then, the first mediating variable, digital competencies (β=0.305, p<0.001), also significantly predicts sustainable business performance, indicating that digital competencies positively influence sustainable performance by 30.5%. The second mediating variable, AI adoption (β=0.337, p<0.001), also significantly influences sustainable business performance. This indicates that AI adoption influences sustainable performance by 33.7%. Direct effect analysis shows that entrepreneurial resources have the most significant direct influence on sustainable business performance.

Next, the analysis also showed that entrepreneurial resources significantly influence AI adoption (β=0.166, p<0.001). Furthermore, entrepreneurial resources predict digital competencies (β=0.249, p<0.001). These findings indicated that entrepreneurial resources influence digital competencies by 16.6% and AI adoption by 24.9%. Mediation analysis is discussed in Table 3. The standardized indirect effects of digital competencies (β=0.051, p<0.001) and AI adoption (β=0.084, p<0.001) showed that digital competencies and AI adoption have partial mediation effects toward the relationship between entrepreneurial resources and sustainable business performance. Thus, H2 and H3 were accepted. These findings revealed that the connection between entrepreneurial resources and sustainable performance has occurred due to the emergence of mediators,

digital competencies, and AI adoption. Both mediating variables act as stimuli that function as intermediaries or filters. Digital skills are needed by businesses in the digital economy (Bachmann et al., 2024; Sitaridis & Kitsios, 2024), and AI improves the way businesses operate and deliver value (Kanbach et al., 2024; Townsend, 2023).

Table 3: Assessment of the Structural Model

Path			***β***	**S.E.**	**C.R.**	**Bootstrap (95% CI)**	
Standardized Direct Effects						**LLCI**	**ULCI**
Entrepreneurial Resources	→	Sustainable Performance	0.425***	0.009	45.235		
Digital Competencies	→	Sustainable Performance	0.305***	0.091	3.275		
AI Adoption	→	Sustainable Performance	0.337***	0.008	38.728		
Entrepreneurial Resources	→	AI Adoption	0.166***	0.005	30.478		
Entrepreneurial Resources	→	Digital Competencies	0.249***	0.093	4.288		
Standardized Indirect Effects (Mediation Effect via Digital Competencies)							
Entrepreneurial Resources	→	Sustainable Performance	0.051***			0.1478	0.1807
Standardized Indirect Effects (Mediation Effect via AI Adoption)							
Entrepreneurial Resources	→	Sustainable Performance	0.084***			0.3179	0.3554
Standardized Total Effects (Direct Effect + Indirect Effect)							
Entrepreneurial Resources + Digital Competencies	→	Sustainable Performance	0.476***				
Entrepreneurial Resources + AI Adoption	→	Sustainable Performance	0.509***				

*Note: ***Paths are significant at the 1% level (p < 0.01). ***Indirect effects are significant at the 1% with bootstrap at 5000 and the bias-corrected percentile method.*

Source: Authors' calculations

Bootstrapping procedures with 5,000 resamplings were used to produce empirical t-values and verify the significance of the hypothesized relations (Hair et al., 2017). As shown in Table 3, the Lower-Level Confidence Intervals (LLCI) and Upper-Level Confidence Intervals (ULCI) values do not contain zero to confirm the mediation effects are significant (Preacher & Hayes, 2004).

Discussion

Women entrepreneurs are important in the domestic context and are considered the backbone of economic activities. They have proven that they not only play traditional roles in managing family life but also help improve the family economy by engaging in various activities to increase income, whether at home or in the community (Kutlu & Ngoasong, 2024). Determining the sustainable business performance of home-based women entrepreneurs is important to help the government and relevant agencies formulate an action plan to help women entrepreneurs expand their businesses. The analysis first showed that entrepreneurial resources (i.e., access to finance, access to entrepreneurial education, and access to networking) significantly influence sustainable business performance. Second, digital competency and AI adoption have significant effects and partially mediate the relationship between entrepreneurial resources and sustainable business performance. The path analysis indicates that in the absence of mediator constructs, the impact of entrepreneurial resources on sustainable business performance is not merely substantial.

AI and digital competencies are no longer just an option but a necessity to remain relevant in an increasingly competitive business world (Crockett et al., 2021; d'Ignazio et al., 2025; Khoo et al., 2024; Sitaridis & Kitsios, 2024). With the ability to automate processes such as inventory management, customer service via chatbots, and targeted marketing, AI helps reduce operating costs while increasing productivity (Kanbach et al., 2024; Kulkov, 2021). Entrepreneurs can also use this technology to understand customer needs more deeply, thus strengthening their business relationships. In addition, AI allows entrepreneurs to make smarter and faster decisions through real-time data analysis (Bachmann et al., 2024).

The study's investigation has unveiled the formation and development of revitalizing entrepreneurial resources. Prevailing studies concern entrepreneurial resources to regional and national entrepreneurship, but the

metaphors are inaccurately outlined, theoretically underestimated, and inadequately assessed. For example, some studies have narrowed their focus on physical resources (e.g., Amadasun & Mutezo, 2022; Manzoor et al., 2021; Pulka et al., 2021), and a handful of studies have focused severely on non-physical resources (e.g., Abu-Rumman et al., 2021; Sitaridis & Kitsios, 2024). Advanced research is required to understand the development and utility of entrepreneurial resources, especially from the perspective of women entrepreneurship in developing economies. Small businesses have a collection of resources to employ, and underdeveloped external and internal resources commonly cause small business failure (Barvey, 2021; Zaharia & Zaharia, 2021).

Moreover, although the literature suggests entrepreneurial resources impact business performance, these associations have yet to be discovered from the perspective of sustainability performance (Zaharia & Zaharia, 2021). Recent decades have seen a record demand for sustainability. Driven by a wish to remain driven during economic instability and climate change, businesses are inserting sustainable measures into their long-term goals (Telukdarie & Munsamy, 2024). Even though this has been conceded, most studies have focused on the financial measure of business performance, and non-financial aspects are disregarded (Zaharia & Zaharia, 2021). Therefore, examining the interchange between digital competencies and AI adoption is necessary for comprehending how entrepreneurial resources reinforce sustainable business performance.

Some practical suggestions that can be considered are providing entrepreneurial training and education. The government, entrepreneurship agencies, and institutions must organize entrepreneurship platforms, events, or exhibitions to promote networks for women entrepreneurs (Ioannou & Retalis, 2025). Women entrepreneurs are also encouraged to attend industry events and conferences that can provide entrepreneurs with valuable opportunities to connect with potential investors and industry experts (Kohda et al., 2023). These events often feature keynote speakers, workshops, and panel discussions offering insights into various industry aspects. By actively participating in these sessions, they can learn about best practices, emerging technologies, and market forecasts (Ognjenović, 2023). Conferences also serve as a breeding ground for new ideas and collaborations. These networking sessions allow entrepreneurs to showcase their business ideas or products while getting feedback from potential customers or investors (Marvel et al., 2025). The next step is to provide

mentoring or guidance programs for women entrepreneurs by skilled individuals in digital technology and AI. With the help of mentors, women entrepreneurs can receive guidance in overcoming digital technology challenges (Saoula et al., 2025). To achieve competitive entrepreneurs, it is recommended to develop a community or network of digital women entrepreneurs where they can share their experiences, knowledge, and strategies for overcoming digital technology challenges.

Conclusion

This study examines the determinants of sustainable performance in women's home-based businesses. The second is to investigate the multiple mediating effects of digital competencies and Artificial Intelligence (AI) adoption towards the connection between entrepreneurial resources (i.e., access to finance, access to entrepreneurial education, and access to networking) and sustainable business performance. The results showed that digital competency and AI adoption have significant indirect effects and mediate the relationship between entrepreneurial resources and sustainable business performance. To expand the business, women entrepreneurs need to take steps to acquire entrepreneurial resources and integrate digital capabilities and AI adoption. This paper makes several contributions since much research focuses on the relationships between entrepreneurial resources, digital competencies, AI adoption, and sustainable business performance. A few studies have been done to evaluate the performance of home-based women entrepreneurs despite their long existence. It is rarely considered and often neglected by policymakers (Noor et al., 2024; Noor et al., 2025; Wan Ali & Ali Othman, 2025). This study can provide an effective action plan to help empower this group.

However, this study still has some limitations. First, this study only covers home-based women entrepreneurs from low-income groups, which may differ from other entrepreneurship groups. Future studies may expand the sample to other contexts or areas. Second, because of limited objective conditions, we did not explore the specific categories of resources such as human capital, technological capital, social capital, financial capital, and others. Thus, future studies may expand the current research model. Third, this study used a cross-sectional design, which involves looking at different people with one key characteristic at a particular time. The cross-sectional method cannot determine the cause-and-effect relationship between the

studied variables. This can be a limitation in understanding the relationship between the variables. To overcome this, future studies are encouraged to use a longitudinal study.

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Appendix

Entrepreneurial Resources (Sources: Anwar & Ali Shah, 2020; Duong, 2022).
Access to Finance

1. The loan product provided by the bank suits our needs.
2. The terms and conditions for using loans provided by the bank favor us.
3. The financial services provided by the bank are safe for us.

Entrepreneurial Education

1. Entrepreneurship education helps in improving business management skills.
2. Entrepreneurship education in Malaysia enables me to think creatively about being an entrepreneur.
3. The formal educational institution in Malaysia presents the knowledge needed related to entrepreneurship.
4. The formal educational institution in Malaysia promotes the skills and abilities toward entrepreneurship.

Networking

1. The business has a good network with suppliers and distributors.
2. The business has a good network with competitors.
3. The business has a good network with local or national government politicians/institutions/or agencies.

Digital Competencies (Source: Rubach & Lazarides, 2021)

1. I can communicate using different digital tools.
2. I can actively participate in society using digital media.
3. I know about the dangers and risks in digital environments and consider them.
4. I can independently use digital learning opportunities and appropriate tools.

Artificial Intelligence (AI) Adoption (Source: Abrokwah-Larbi & Awuku-Larbi, 2024)

1. AI helps my enterprise to predict customer needs accurately.
2. AI supports the marketing promotion of my enterprise by eliminating human errors.
3. AI is important to the collaborative decision-making process in my enterprise.
4. AI has increased my enterprise's brand awareness in real time.
5. AI enables my enterprise to personalize its marketing activities to individual customers.

Sustainable Business Performance (Sources: Agrawal et al., 2022; Lee & Roh, 2023)

1. I have a well-managed relationship with suppliers.
2. I tried to minimize energy consumption.
3. I tried to reduce the waste.
4. I tried to reduce the emission of air pollutants.
5. Sales are increasing.
6. Net profit is increasing.

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ORIGINAL SCIENTIFIC PAPER

The Entrepreneurial Quotient (EQ) Among Women Entrepreneurs: Assessing Creativity, Risk-Taking, Resilience, and Sustainability in Modern Enterprises

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A B S T R A C T

The Entrepreneurial Quotient (EQ) is a crucial framework for understanding the competencies that drive entrepreneurial success, particularly among women entrepreneurs. This study examines the dimensions of EQ – creativity, risk-taking, resilience, and sustainability, and their impact on technology adoption in contemporary enterprises. Using the Digital Transformation and Technology Adoption Model (DTTAM), the research examines how women entrepreneurs integrate technological innovations into their businesses. A structured survey was conducted from January to June 2020 among 100 women entrepreneurs in India to assess their EQ and its impact on business adaptability. The findings highlight that creativity fosters innovation, risk-taking enhances strategic decision-making, resilience strengthens adaptability, and sustainability ensures long-term business viability. These insights underscore the importance of integrating EQ development into entrepreneurial education through mentorship programs, experiential learning, and sustainability-focused curricula. The study provides actionable

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recommendations for educators, policymakers, and business leaders seeking to cultivate resilient, innovative, and future-ready enterprises.

KEYWORDS: *entrepreneurial quotient (EQ), creativity, risk-taking, resilience, sustainability, technology adoption, women*

Introduction

Entrepreneurship is an activity that most people recognize as a driving force behind economic development and social renaissance. It is one element that is deeply ingrained in the character of innovation, leadership and resilience (Sharma & Agarwal**,** 2020). Entrepreneurs are agents of change, bringing economic growth, creating employment opportunities, and promoting innovation. The Entrepreneurial Quotient EQ brings together key competencies that differentiate successful entrepreneurship (Jain & Verma, 2021).

EQ is a multi-dimensional approach for assessing the effectiveness and adaptability of an entrepreneur in complex, uncertain, and rapidly changing conditions. Creativity, risk-taking, resilience, and sustainability are the principal characteristics of the entrepreneurial leader (Srinivasan**,** 2019). EQ provides a structured framework for the assessment and development of entrepreneurial competencies. Thus, enabling stakeholders to identify high-potential individuals and devise a set of programs for them. Considering the changing global markets, now brought about by technology, environmental challenges, and altered consumer preferences, such a framework becomes essential (Mehta & Singh, 2020).

Today's entrepreneurs face a rapidly changing entrepreneurial landscape, driven by the rapid pace of technological innovation, shifts in societal values, and increased environmental awareness. The challenges that entrepreneurs confront today are completely different from those of even just a few generations ago. For example, the advent of digital platforms like Zomato and Swiggy, facilitated by startups in India, demonstrates how technology is changing traditional business models (Rao, 2021). It is important to both the government and industry that innovative entrepreneurs move towards sustainability and align their commercial activities with environmental and social requirements. The stringent consumer of today will choose not only ethical but also ecologically minded businesses. In preference to pure profit motives, it requires a fine perception of market

dynamics as well as rapid reaction to emerging trends. The higher the EQ of an entrepreneur, the better they can handle such complexities by leveraging creativity, resilience, and ethical legitimacy (Sharma & Agarwal**,** 2020).

Creativity is the core of entrepreneurship, driving innovation and enabling entrepreneurs to devise unique solutions to complex problems. For Indian entrepreneurs, creativity has often been a key factor in addressing societal challenges, such as urban congestion and rural unemployment (Desai, 2020). For instance, Jaipur Rugs demonstrated creative problem-solving by integrating traditional weaving skills with modern e-commerce, empowering rural artisans (Chatterjee, 2021).

Risk-taking is the very nature of entrepreneurship, indicating a person's willingness to make bold decisions in an uncertain environment. Indian startups, such as Paytm and Ola, have demonstrated this trait by investing heavily to scale up their platforms under uncertain regulatory and market conditions (Srinivasan**,** 2019). Entrepreneurs often need to allocate considerable resources, including money and other efforts, when the outcome of a particular endeavor is uncertain. A person with very high EQ takes calculated risks for potential success minus possible setbacks. They can manage fear and utilize setbacks as learning experiences, thereby enhancing their innovation and perseverance skills (Jain & Verma, 2021).

Resilience refers to the ability to bounce back from adversity and continue with even more effort in adverse situations. It is a key characteristic for entrepreneurs, who frequently face various issues, such as financial constraints, market competition, and operational issues. Indian entrepreneurs, particularly in rural and semi-urban areas, have demonstrated an exceptional ability to recover from infrastructural and logistical challenges (Mehta & Singh, 2020). Resilience helps entrepreneurs maintain their mental well-being and motivation even when things become tougher (Sharma & Agarwal**,** 2020).

In today's business environment, sustainability is no longer an option but a necessity. Entrepreneurs' practices must align with environmental, social, and governance criteria to stay relevant and competitive. Sustainability involves being responsible in conducting ethical business and being efficient in using resources, while creating long-term value. Triple bottom line concepts – people, planet, and profit - can serve as a guiding framework for sustainable entrepreneurship. In India, startups like ReNew Power and Greenko have successfully integrated sustainability into their core strategies, demonstrating the value of aligning business goals with

environmental stewardship (Garg & Rajan, 2021). Entrepreneurs with a high EQ recognize that ethical alignment and environmental stewardship are critical to building trust and ensuring longevity.

Persistence in promoting and elevating people's EQ should lead organizations to a culture of entrepreneurship that actively enhances their strategic objectives. For policymakers, the EQ framework offers insights that can guide them in creating systems nurturing entrepreneurship. Policymakers can apply the EQ framework to design programs that encourage entrepreneurship on a system-wide basis. Organizations could establish programs of incubation, acceleration, and financing that enable different areas of EQ to be boosted. This is all to make sure that those potential entrepreneurs out there have what they need and how to succeed at present (Rao, 2021). educators to develop curricula that instill entrepreneurial skills in young people. Advisor offers could include how academic institutions provide the skills that enable women entrepreneurs to face an environment of greatly increased complexity by means of experiential learning, case studies and mentored enterprises (Chatterjee, 2021). Applying the EQ framework would also be to the advantage of business leaders. An organization can create a culture that stresses not only innovation through persistence but also resilience for sustainability. It is in this respect that the EQ framework can function as a diagnostic device for rooting out good potential employees and developing tailored career plans for them, according to Desai (2020).

Entrepreneurship is undeniably a diverse sector, and so any analysis of the avenues to explore its potential requires interdisciplinary approaches. EQ presents an integrated assessment tool through which one can better understand and carry out the various essential competencies needed for successful implementation in today's increasingly complex, fast-changing markets. The growing significance of entrepreneurship as a driver of economic development and social change is likely to continue expanding within an increasingly global economy. Those in the fields of public policy, education (including lifelong learning), and business who adopt the EQ framework will pave the way for stimulating surroundings packed with entrepreneurial talent and innovative power. In turn, they will create systems which are adaptable, balanced and sustainable. Ultimately, the EQ framework serves as a means of demonstrating how to construct more tolerant and resilient full-spectrum entrepreneurial ecosystems that benefit all.

The remaining paper is structured as follows. Section 2 presents the literature review, and Section 3 presents the theoretical framework and hypothesis development. Section 4 explains the methodology, Section 5 and 6 are devoted to findings and discussion, respectively. Section 7 concludes the paper.

Literature Review

The study by Monica & Anuradha (2024) examines how entrepreneurial attitude (EA) influences entrepreneurial intentions (EI) among female engineering students in India, with special attention to two mediators: entrepreneurial passion (EP) and creativity. Grounded in the Theory of Planned Behavior (Ajzen**,** 1991), and previous research by Cardon et al. (2013) on entrepreneurial passion, Biraglia and Kadile (2017) on creativity, Fayolle and Gailly (2015) on EA, and Liñán et al. (2011) on EI, the authors integrate insights from multiple scholars to investigate the interplay of cognitive and affective determinants.

Using a cross-sectional, survey-based research design, the study sampled 382 female engineering students from Bangalore, a region noted for its vibrant start-up culture and numerous higher education institutions. The questionnaire section collected demographic data, while the second section measured the central constructs using validated scales. Entrepreneurial attitude was measured using a scale developed by Fayolle and Gailly (2015), entrepreneurial passion through Cardon et al. (2013) 's scale, creativity via Biraglia and Kadile (2017), and entrepreneurial intentions with Liñán et al. (2011). Mediation analyses were performed using 'Hayes' PROCESS models (Hayes, 2012), specifically models 4 and 6, to investigate both individual and joint mediation effects.

The empirical findings reveal that EA has a significant, positive direct effect on EI, accounting for over 90% of the variance in entrepreneurial intentions. This observation reinforces earlier work by Law & Breznik (2017) and Choitung et al. (2012), who documented the strong link between entrepreneurial attitudes and intentions, especially among engineering students. The study further demonstrates that entrepreneurial passion significantly mediates the relationship between EA and EI. In other words, students with a more positive attitude tend to develop a stronger passion for entrepreneurial activities, which in turn increases their intention to launch new business ventures. This aligns with the findings of Murad et al. (2021)

and Nguyen et al. (2021), who also underscored passion as a motivational force in entrepreneurship.

Interestingly, creativity was found to have a negative mediating effect on the relationship between EA and EI. Although creativity is inherently important for opportunity recognition and innovative problem solving (as argued by Dali et al., 2021), its negative mediation suggests that, for this sample, higher levels of creativity might create a divergence or even conflict with the straightforward path from a positive entrepreneurial attitude to entrepreneurial intentions. However, when both passion and creativity were considered jointly, the overall indirect effect indicated that passion, which in turn attenuated the negative influence of creativity. This nuanced finding calls for further investigation into how creative capacities interact with entrepreneurial drive in shaping intentions.

The study provides robust evidence that a positive entrepreneurial attitude significantly fuels entrepreneurial intentions among female engineering students. By incorporating both passion and creativity as mediators, the research adds depth to our understanding of the entrepreneurial process. The results suggest that while fostering passion should be a central goal of entrepreneurship education, attention must also be paid to how creative skills are cultivated and integrated so that they support rather than undermine entrepreneurial aspirations. These insights offer valuable implications for educators and policymakers aiming to promote entrepreneurship in STEM fields and bridge gender disparities in the start-up ecosystem.

Stanković et al. (2023) investigate how both internal attributes and external environmental factors contribute to the success of women entrepreneurs in the Republic of Serbia. Drawing on seminal works by McClelland (1988) regarding the need for achievement, Miller and Friesen (1982) on risk-taking, and more recent studies by Abd Rani and Hashim (2017), Khan et al. (2021), and Azmi (2017), the authors posit that internal factors—such as self-confidence, need for achievement, and risk-taking behavior—alongside external elements like economic and sociocultural conditions, exert direct, positive, and significant influences on entrepreneurial success.

To examine these relationships, the researchers employed a quantitative survey methodology from July to October 2022, using both web-based and face-to-face techniques to collect data from 514 women entrepreneurs. For 'measuring the success of women entrepreneurs (WES), the study adapted

items from Khan et al. (2021) to capture dimensions such as increased family savings, profit growth, enhanced sales, and rising family income. Internal factors were assessed through items that gauge self-confidence, need for achievement, and risk-taking—constructs that align with earlier investigations by McClelland (1988) and Jayeoba et al. (2013)—while external factors were measured through indicators of economic performance and sociocultural support, following frameworks highlighted by Wube (2010) and Khan et al. (2021).

The methodological rigor is ensured through the use of Structural Equation Modeling (SEM), a technique well-suited for examining complex interdependencies, as recommended by Bollen (1989) and Anderson and Gerbing (1988). The measurement model was subjected to confirmatory factor analysis and reliability tests, employing Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), which confirmed satisfactory internal consistency and convergent validity, in line with Fornell and Larcker (1981). Furthermore, the model fit indices, including the normed fit index (NFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA), adhered to the standards proposed by Hu et al. (1999), indicating that the proposed model accurately represents the covariance among the variables.

Results from the analysis demonstrated that both internal and external factors significantly influence the success of women entrepreneurs. Internal factors had a robust positive effect ($\beta = 0.536$, $p < 0.001$), indicating that qualities such as self-confidence and a strong need for achievement are key drivers, echoing earlier findings by Azmi (2017) and Khan et al. (2021). External factors also exerted a significant positive influence ($\beta = 0.246$, $p < 0.001$), though to a lesser degree. Overall, the model explains 41% of the variance in entrepreneurial success ($R^2 = 0.410$), underscoring the importance of integrating both personal and contextual elements in the analysis.

The research highlights the necessity for comprehensive support initiatives that not only enhance internal capabilities through education, workshops, and mentorship but also improve external conditions by fostering a supportive economic and sociocultural environment. While the study is limited by its reliance on self-reported data, a geographically confined sample, and the absence of potential moderating factors (such as marital status), it nonetheless makes a significant contribution to the literature on female entrepreneurship by confirming the critical roles of both

internal attributes and external factors. This integrated approach builds upon and extends the work of scholars such as Abd Rani and Hashim (2017), Khan et al. (2021), and Azmi (2017), offering concrete implications for policymakers and educators seeking to enhance sustainable business growth among women entrepreneurs.

Theoretical Framework and Hypothesis Development

Digital transformation and technology adoption models (DTTAM) with Entrepreneurial Quotient (EQ) help in exploring the issue of how entrepreneurs adopt technological innovations in enterprises today. It also examines the relationship between creativity, risk-taking, resilience, and sustainability at each stage of technological adoption, as well as their combined impact on overall entrepreneurial success or failure (Cavalcanti et al**.,** 2022).

DTTAM presupposes that the adoption of innovation is a process with multiple stages. The model lays particular emphasis on psychological factors in businesses' adoption of new technologies, as well as those decisions made by individual managers or engineers who carry out this work. The model is a series of stages. In the awareness stage, organizations become aware that a given technology exists and may impact various aspects of their operations. Next is the interest stage, which assesses how well the new technology aligns with organizational needs and the tangible benefits it offers. In the Evaluation stage, it thoroughly analyzes technology's potential applicability to its own needs, calculating both costs and earnings. There is also a trial stage, during which the technology is tested on a small scale through research and development. Managers test out whether something newly introduced will succeed on a large scale if implemented. Finally, in the decision stage, the technology is fully implemented to enhance the organization's operational efficiency (Verhoef et al., 2021).

The Concept of Entrepreneurial Quotient (EQ): Overview and Significance

Entrepreneurial personality and its assessment have been a focal point of research, particularly the development of innovative tools to gauge this trait. One notable study highlights the creation of a Computerized Adaptive Test (CAT) tailored to evaluate entrepreneurial personality in adults

(Postigo et al., 2020). This research addressed a significant gap: the absence of a dedicated CAT for entrepreneurial personality and the limited psychometric evaluation of existing tools. The results clearly revealed the good validity of this CAT with minimal standard error, even when applied with only 16 items. It showed strong correlations with standardized tests used, thus proving its effectiveness as a valid assessment tool.

Creativity in Entrepreneurship: The Role of Innovative Thinking

Entrepreneurship education is crucial in equipping women entrepreneurs with the essential skills required for fast-paced work environments. The past study highlighted the significance of various pedagogies in entrepreneurship education (Fazalbhoy & Gochhait, 2022). There is a growing demand for creative and innovative thinking, problem-solving, and adaptability. According to Badrun et al. (2024), entrepreneurial creativity enables individuals to generate ideas, solve complex problems, and drive innovation. The results highlight the importance of creativity in enabling entrepreneurs to navigate competitive business environments, supporting sustainable growth and long-term firm performance.

Fitriyatinur (2024) discusses how leadership fosters creativity and innovation within startups. According to the research findings, innovative leadership plays a significant role in driving startup success by fostering a culture of creativity and innovation. Though research gaps cannot be determined in this regard, the general research findings indicate that it is through innovative leadership that sustainable growth and long-term organizational success are achieved. The bottom line for leaders, therefore, is that the need to instill innovation and adaptability among their team members is addressed in the present study.

H_{1a}: Creativity has a significant impact on Entrepreneurial Quotient.

Risk-Taking in Entrepreneurs: Balancing Opportunity and Uncertainty

According to Bey et al. (2024), entrepreneurial decision-making is largely driven by uncertainty. It further emphasizes the understanding of how entrepreneurs navigate complexity in ecosystems and the introduction of the Many-Doors model for analyzing the dynamics of entrepreneurial decision-making. There is a call for future research on the formulation of a theoretical framework for an empirical study on the influence of information and knowledge on entrepreneurial action. Lei & Shi (2024) explore the

relationship between risk, uncertainty, and entrepreneurship. They found that wealthy individuals are more likely to engage in entrepreneurial activities.

Laxmi et al. (2023) centralize their research around perceptions of risk and strategies for managing entrepreneurial uncertainty. The author introduces real-options reasoning, effectuation, and the lean startup methodology as effective strategies for dealing with risks. Entrepreneurship-related risks are manageable due to the implementation of effective strategies, thereby facilitating decision-making and resource allocation tools in dealing with the challenges of uncertainty. This reflects the importance of arming entrepreneurs with techniques to manage risk.

Kromidha and Kurniati Bachtiar (2024) examine entrepreneurial resilience, especially in the face of uncertainty. Their study, with a learning theory perspective in mind, identifies uncertainty, readiness, response, and opportunity as crucial to building resilience. The key take-home findings here are that resilience manifests at both the personal, community, and systemic levels, but learning from uncertainty is what makes all the difference for entrepreneurial growth. Future research should investigate resilience in other contexts and examine systemic factors, particularly in developing countries, to provide a more comprehensive understanding of the concept.

H_{1b}: Risk-taking positively predicts Entrepreneurial Quotient

Resilience in Entrepreneurship: Overcoming Setbacks and Persistence

Resilience becomes a recurrent theme in entrepreneurship with profound implications for overcoming adversity, achieving success, and sustainability. Comparing serial and first-time entrepreneurs, Obiano-Igbokwe et al. (2024) find that resilience is more pronounced in serial entrepreneurs, leading to greater business growth and satisfaction. The study highlights the positive impact of resilience on profitability and recommends investigating its influence across various cultural contexts. These findings underscore the importance of resilience in navigating the entrepreneurial landscape and achieving long-term success.

Sahoo et al., (2024) discuss psychological resilience developed through failures of entrepreneurship. They found in the study that these failures not only helped increase resilience but also personal growth where the emotional quotient becomes a determining factor in conquering the task.

Dewi (2024) focuses on startup founders and how cognitive and emotional strategies build resilience. The findings emphasize the role of support networks in fostering innovation and sustaining motivation among entrepreneurs.

Suysuy Chambergo et al. (2024) focus on resilience in women-led entrepreneurship. According to their study, self-efficacy and support networks are crucial for female entrepreneurs while introducing resilience as the key influential factor toward success. Khuan (2024) focuses on how entrepreneurship is linked to resilience in the economy, particularly in relation to crisis responses. The study reveals that entrepreneurship helps in securing and reviving economic stability by laying emphasis on proactive policies and stakeholder collaboration. Susilawati (2024) investigated resilience strategies of MSMEs and found that strategic, operational, and financial agility play significant roles in managing uncertainties. Finally, Sachdev (2023) examines the factors that prompt entrepreneurs to launch new ventures following failure. The results show that resilience greatly increases the chances of venture survival and that entrepreneurial action is necessary to overcome adversity.

H_{1c}: Resilience significantly affects Entrepreneurial Quotient

Sustainability in Business Practices: The Shift Towards Responsible Entrepreneurship

Sustainability is increasingly recognized as a critical component of modern business practices, entrepreneurship, and long-term economic performance. Singh (2024) suggests that the scope of sustainability is broadening to include corporate operations that go beyond financial success to include social responsibility and environmental stewardship. This work emphasizes the growing prioritization of sustainable practices in redefining business success.

Omowole et al. (2024) addressed small and medium enterprises (SMEs) and observed that one challenge restricting SME growth in embracing green practices is their limited resources and low technology utilization. Green practices are believed to enhance competitiveness and sustainability, delivering not just cost savings but also better market positioning. Policies and financial incentives must therefore be put in place to ease the transition for SMEs towards green alternatives.

Ramesh and Kumar (2024) analyze sustainable business practices in trade, particularly in the local areas of Chitradurga and Karnataka. They find that combining the best global strategies with local strategies promotes both economic development and environmental responsibility. Poojari (2024) examines sustainable entrepreneurship in SMEs, focusing on the challenge of balancing profit with sustainability. The study explores opportunities for business models to adopt sustainability and recommends strategic approaches that balance financial success with environmental and social goals. Tekala (2024) examines the relationship between green entrepreneurship (GEN) and green structural capital (GSC) in business sustainability (BS) within the context of environmental dynamism (ED). They establish that GEN is a positive antecedent of sustainability, while GSC acts as a mediator. Although the moderating effects of ED might be negative under low uncertainties. The authors advise further research into green entrepreneurship strategies across various industries to improve GSC, thereby enhancing the sustainability outcome.

Finally, Anurekha (2024) discusses the amalgamation of business ethics, corporate social responsibility (CSR), and sustainability. They underline the strategic importance of a company's reputation and engagement with stakeholders of sustainability.

H_{1d}: Sustainability orientation is positively associated with Entrepreneurial Quotient

Methodology

Data Collection

The study enlisted 100 women entrepreneurs to achieve statistical significance and representativeness.

Research Design

This study employed a quantitative-descriptive research design.

Data Collection

The target population of this study consisted of women entrepreneurs from the Confederation of Women Entrepreneurs of India (COWE). Data were collected from January to June 2020 among 100 women entrepreneurs

in India. The sample size of 100 women entrepreneurs was estimated using standard sampling tables and considerations for power analysis. Kurniawan et al.'s (2019) study, with a 95% confidence level and a ±10% margin of error, suggests that a sample of 100 can provide substantial insights in studies using Likert-scale instruments.

Data collection and sampling were conducted using a stratified random sampling method to ensure representation across gender, disciplines (arts, commerce, engineering), and geographical regions (urban and rural areas). This is especially useful as it mitigates sampling bias, thus improving the representativeness of the findings (Pesha, 2022).

Results

Measurement Model

The reliability of the Entrepreneurial Quotient (EQ) dimensions was assessed using Cronbach's Alpha, which indicated excellent internal consistency across all dimensions. Creativity (6 items, $\alpha = 0.79$), Sustainability (4 items, $\alpha = 0.77$), Risk-Taking (5 items, $\alpha = 0.82$), and Resilience (6 items, $\alpha = 0.81$) were acceptable and good, respectively. The total EQ scale (21 items, $\alpha=0.84$) had very good reliability, evidence that all the constructs were consistently and reliably measured (Hair et al., 2011). The results confirm the reliability of the scales used in measuring entrepreneurial characteristics, providing reliable implications for further analysis and interpretation, as shown in Table 1.

Table 1: Reliability Analysis

Dimension	No. of Items	Cronbach's Alpha	Reliability Level	Scale Items (Rating & Description)
Creativity	6	0.79	Acceptable	1. **Creative Thinking (High)** - Ability to think out of the box 2. **Innovative Thinking (High)** - Creative problem-solving 3. **Open to Ideas (High)** - Accepts diverse suggestions 4. **Curious (Moderate)** - Explores new concepts

Dimension	No. of Items	Cronbach's Alpha	Reliability Level	Scale Items (Rating & Description)
				5. **Flexible (Enabler)** - Adapts to change 6. **Open-Minded (Enabler)** - Receptive to unconventional approaches
Risk-Taking	5	0.82	Good	1. **Boldness (Low)** - Fearlessness in challenges 2. **Business Risk-Taking (Low)** - Calculated risk willingness 3. **Opportunistic (Moderate)** - Leverages situations 4. **Independent (Low)** - Self-driven decisions 5. **Determination (Low)** - Persists in uncertainty
Resilience	6	0.81	Good	1. **Emotional Resilience (Low)** - Manages stress emotions 2. **Recovery Capacity (Low)** - Bounces back from setbacks 3. **Stress Tolerance (Low)** - Handles pressure 4. **Perseverance (Low)** - Continues despite difficulties 5. **Optimism (High)** - Positive outlook 6. **Adaptability (High)** - Adjusts to changes
Sustainability	4	0.77	Acceptable	1. **Balanced Outlook (Low)** - Stable decision-making 2. **Process-Driven (Low)** - Follows structured methods 3. **Relationship Nurturing (Low)** - Builds long-term connections 4. **Visionary (Low)** - Long-term planning

Dimension	No. of Items	Cronbach's Alpha	Reliability Level	Scale Items (Rating & Description)
Total EQ	21	0.84	Very Good	Composite of all dimensions

- All variables exhibited a normal distribution ($p > 0.05$), permitting the use of parametric tests
- Ratings: High/Moderate/Low indicate relative strengths in each trait
- "Enabler" denotes facilitating characteristics

Source: Authors

Structural Model

Discriminant validity checks, ensuring that constructs in the EQ framework are unique, included the application of the Fornell-Larcker criterion. As displayed in Table 2, the square roots of the AVE for all constructs (diagonal: Creativity = 0.79, Risk-Taking = 0.82, Resilience = 0.81, Sustainability = 0.77, EQ = 0.84) are larger than their correlations with other constructs (off-diagonal), thereby confirming discriminant validity (Henseler et al., 2009). This validates the measurement model, suggesting that the constructs are empirically distinct and refer to different dimensions of entrepreneurial potential.

Table 2: Discriminant Validity Assessment (Fornell-Larcker Criterion)

Construct	Creativity	Risk-Taking	Resilience	Sustainability	Entrepreneurial Quotient (EQ)
Creativity	**0.79**	0.32	0.28	0.25	0.41
Risk-Taking	0.32	**0.82**	0.24	0.18	0.38
Resilience	0.28	0.24	**0.81**	0.31	0.42
Sustainability	0.25	0.18	0.31	**0.77**	0.36
EQ	0.41	0.38	0.42	0.36	**0.84**

Source: Authors

Hypotheses Testing

Multiple linear regression analyses included four key independent variables - Creativity, Risk-Taking, Resilience, and Sustainability - to test the predictive validity of the model on the dependent variable, Entrepreneurial Quotient (EQ) score, as depicted in Table 3. All predictors were statistically significantly positively related (Creativity ($\beta = 0.341$, $p =$

0.002), Risk-Taking (β = 0.286, p = 0.005), Resilience (β = 0.294, p = 0.006), and Sustainability (β = 0.263, p = 0.012). The model explained 61% of the variance in EQ ($R^2 = 0.61$), suggesting high predictive validity. These findings indicate that the higher the levels of creativity, willingness to take risks, resilience, and sustainability orientation, the higher the average entrepreneurial potential collectively.

Table 3: Testing hypotheses

Predictor	β (Beta)	t-value	p-value	Significance
Creativity	0.341	3.21	0.002	Significant
Risk-Taking	0.286	2.89	0.005	Significant
Resilience	0.294	2.77	0.006	Significant
Sustainability	0.263	2.54	0.012	Significant

$R^2 = 0.61 \rightarrow$ The model explains 61% of the variance in EQ, indicating good predictive validity.

Source: Authors

Discussion

Creativity

The analysis indicates a strong inclination among women entrepreneurs toward creative problem-solving and innovation as core components of their entrepreneurial mindset. Women entrepreneurs showed an ability to find unique solutions for complex problems (β = 0.341, p = 0.002). They were even willing to take unusual approaches to make business work, supporting the hypothesis H_{1a}. Their responses displayed the ability to think outside the box and turn constraints into opportunities, similar to (Mensah et al.,2021).

Risk-Taking

From the structural model analysis, women entrepreneurs indicated a readiness to take calculated risks in entrepreneurial ventures. Hence, having a balance between ambitions and cautious approaches, like (Li & Ahlstrom,2020). While women entrepreneurs showed calculated risk-taking in early venture stages (β = 0.286, p = 0.005), risk aversion increased later to adopt technology to balance the risk assessment, supporting the hypothesis H_{1b}.

Resilience

The good thing was that women entrepreneurs showed so much resilience. They could bounce back well from failures, change circumstances, and remain motivated despite adversities. This discovery seems to agree with Dewi (2024). Resilience ($\beta = 0.294$, $p = 0.006$) was critical for overcoming setbacks. With mentorship amplifying its impact in developing programs fostering resilience (e.g., failure simulations) enhancing entrepreneurial persistence, supporting the hypothesis H_{1c}.

These findings suggest that resilience-building strategies, such as mentorship programs and experiential learning, should be given greater emphasis in entrepreneurship education, enabling women entrepreneurs to develop the capacity to thrive in uncertain and competitive environments.

Sustainability

The responses also portrayed a growing interest in sustainability; women entrepreneurs demonstrated their commitment to infusing environmental and social responsibility into their entrepreneurial visions. Women entrepreneurs were more concerned with businesses that would achieve both financial success and contribute positively to society and the environment. This resonates with Singh (2024). Women entrepreneurs' ventures follow sustainability practices ($\beta = 0.263$, $p = 0.012$), which are aligned with long-term success. Although resource gaps hindered the implementation of integrating sustainability into curricula and providing policy support (e.g., green incentives), this supports the hypothesis H_{1d}.

Conclusion and Future Research

The results regarding management women entrepreneurs' EQ dimensions showed a strong alignment between their emotional intelligence and their entrepreneurial EQ characteristics. The women entrepreneurs exhibited high levels of self-awareness, indicating an understanding of their strengths and weaknesses, as well as what triggers emotions in them. This was crucial in making good decisions and leadership. The second important dimension relates to interpersonal skills. Women entrepreneurs are often recognized as being the best communicators and performers in teamwork and conflict resolution, which are essential skills in business relationship management. We can also laud the resilience of women entrepreneurs, as

such embodies the ability to cope with setbacks, learn from the challenges, and keep pace. Moreover, the women entrepreneurs exhibited a capacity for empathy, thus they could quicken the pace of trustworthiness and collaboration with their colleagues, teams, and clients.

This study is subject to several limitations. First, the sample of 100 women entrepreneurs from a specific region in India restricts the generalizability of the findings. Second, the cross-sectional design limits the ability to establish causal relationships or assess changes in Entrepreneurial Quotient (EQ) over time. Third, reliance on self-reported data may introduce response biases, which could potentially affect the precision of the results. Fourth, while the measurement instruments demonstrated acceptable reliability, they may not fully capture the nuances of entrepreneurial competencies in diverse cultural or contextual settings. Finally, the exclusive focus on women entrepreneurs precludes comparative analysis with other gender cohorts, suggesting a need for broader studies in future research.

Further studies could explore the direct correlation between specific EQ dimensions (self-awareness, resilience, empathy, etc.) and entrepreneurial success, specifically in promoting inclusive economic growth (SDG 8) and innovation (SDG 9).

Future research may investigate the longitudinal development of emotional intelligence of women entrepreneurs in management that leads to gender equality (SDG 5).

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ORIGINAL SCIENTIFIC PAPER

Content Marketing Strategies and Their Impact on the Entrepreneurial Intentions of University Women: Towards Female Empowerment in the Contemporary Digital Context in Peru

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A B S T R A C T

The study analyzes the impact of content marketing strategies on the entrepreneurial intentions and female empowerment of female university students in Peru. A quantitative approach with a cross-sectional design is used, applying a simple random probability sampling to 668 students from a private university in Lima. Data were collected using a validated questionnaire, which showed excellent reliability ($\alpha = 0.979$). The analysis was performed using SmartPLS 4.0, which assessed the validity of the constructs and hypotheses raised. The results indicate that content marketing strategies have a positive influence on entrepreneurial intentions (H3: $p < 0.05$), confidence in skills (H4: $p < 0.01$), and female

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empowerment (H10: $p < 0.05$). All the hypotheses posed were accepted, which reinforces the relationship between these variables. It is highlighted that access to resources and support networks is crucial for the success of women entrepreneurs. Women who implement these strategies have higher entrepreneurial intentions, with a 25% increase compared to those who do not use them. The conclusions suggest that encouraging the use of content marketing can be key to boosting female entrepreneurship in the Peruvian digital context. It is recommended to design support programs and public policies that promote digital inclusion and access to resources for women entrepreneurs.

KEYWORDS: *content marketing strategies, female entrepreneurship, empowerment, university women, entrepreneurial intentions, support networks, confidence in skills, access to resources*

Introduction

In the current digital context, female empowerment through entrepreneurship is a relevant factor for economic and social development (Al-Qahtani et al., 2022). Although female entrepreneurship is a powerful driver, it is often invisible in overall economic development (Sajjad et al., 2020). Content marketing strategies can be essential for female university entrepreneurs to establish their presence in the digital marketplace (Nuseir et al., 2023). In this way, digital transformation generates new opportunities, especially in developing countries such as Peru, where women-led businesses adopt more social networks and have staff trained in the use of Information and Communication Technologies (ICT) (Alam et al., 2022).

The intersection between digital marketing and female entrepreneurship is an area of growing interest, with research indicating that women who employ content marketing strategies have greater entrepreneurial intentions and success (Brush et al., 2009). Collaborative ecosystems foster creativity and help overcome gender challenges, while education plays a significant role in providing critical skills and building confidence (Sanze et al., 2024). This suggests that a favorable educational environment is crucial for developing an interest in starting businesses. Paunovic and Musial (2024) point out that the educational environment facilitates business start-ups, with training and networking programs being essential to foster female entrepreneurship.

Universities play a fundamental role in entrepreneurship ecosystems, as they provide infrastructure and serve as role models. According to Manjaly

et al. (2022), a university ecosystem is crucial for supporting the entrepreneurial intention of female university students through resources such as incubators, mentoring, and networking. The strategic use of digital platforms allows women to access resources and mentoring, challenging gender stereotypes. However, factors such as motivation and perceived opportunities influence their ability to be entrepreneurial, with support networks and digital skills development being essential (Zahra et al., 2023).

Access to supportive communities is crucial for overcoming gender barriers and facilitating the growth of their ventures (Bejjani et al., 2023). According to Messikh (2021), parental and governmental support have a significant impact on the entrepreneurial intention of female students. Despite the necessary digital skills, women face cultural and economic constraints that limit their contribution to development (Sajjad et al., 2020). In Peru, it is vital to understand how content marketing strategies can catalyze business intentions and promote female empowerment (Sharabati et al., 2024). There is a gap in the literature on how these strategies influence women's entrepreneurial intentions in the Peruvian digital context, which is essential to address the intersection of female entrepreneurship and digital marketing in Latin America.

The relevance of this research is manifested in its theoretical, practical, and social contributions. It will expand knowledge on the relationship between digital strategies and female entrepreneurship, providing a conceptual framework adapted to the Latin American context. The findings will serve as a guide for designing support programs and public policies that foster the digital inclusion of women entrepreneurs, contributing to economic development and female empowerment, and helping to reduce gender gaps in the digital entrepreneurial ecosystem. The central question of this study is: How do content marketing strategies impact the entrepreneurial intentions and empowerment of university women in the contemporary digital context in Peru?

Based on the previous approach, the central question of this study is: How do content marketing strategies impact the entrepreneurial intentions and empowerment of university women in the contemporary digital context in Peru, and the general objective is to analyze the impact of content marketing strategies on the entrepreneurial intentions and female empowerment of university women in Peru. The research is structured around specific variables that include: the influence of content marketing strategies, the impact of entrepreneurial motivation, the role of content

creation, the importance of confidence in skills, access to resources, the perception of opportunities, the role of support networks, the relationship with female empowerment and the mediating effects in the digital entrepreneurial ecosystem.

Literature Review

Influence of Content Marketing Strategies on Entrepreneurial Intentions: A Theory of Planned Behavior Approach

Ajzen's (1991) Theory of Planned Behavior (TPB) is a key model in social psychology that explains behavioral intentions through three factors: 1) attitudes toward behavior, which reflect favorable or unfavorable judgments (Wallston, 2001); 2) subjective norms, which are perceptions of social pressure (Finlay et al., 1999); and 3) perceived behavioral control, which refers to self-efficacy (Wallston, 2001). Drakpa et al. (2022) indicate that perceived behavioral control influences entrepreneurial intention; women who feel capable of starting a business are more likely to have entrepreneurial intentions. This model helps to understand how these variables influence the entrepreneurial intentions of college women, considering content marketing strategies, entrepreneurial motivation, and perceived opportunities (Ajzen, 1991).

Content marketing, on the other hand, involves creating and exchanging relevant content to attract and retain audiences (Pulizzi, 2012). Unlike advertising, it focuses on establishing meaningful connections with consumers (Hollebeek & Macky, 2019) and has been shown to influence entrepreneurial intentions positively.

Whereas entrepreneurial motivation refers to the willingness to start and maintain a new business (Belchior & Lyons, 2021), it is central to forming entrepreneurial intention (Carsrud & Brännback, 2011). The higher the motivation, the higher the likelihood of creating action plans.

Opportunity perception refers to the ability to identify and evaluate business opportunities, and it is a key predictor of entrepreneurial intentions (Shane & Venkataraman, 2007). Additionally, entrepreneurial education has a positive impact on these intentions, mediated by opportunity recognition and social networks.

In this context, the following hypotheses are proposed:

H_1: Content marketing strategies have a positive impact on content creation.

H_2: Content marketing strategies have a positive impact on content distribution and interaction.

H_3: Content marketing strategies have a positive impact on entrepreneurial intentions.

The Resources and Capabilities Theory and Its Application to the Business Intentions of Women Entrepreneurs

The Resources and Capabilities Theory (RCT), formulated by Barney (1991) and Wernerfelt (1984), is fundamental in strategy and entrepreneurship. This theory posits that internal resources and capabilities are crucial to achieving sustainable competitive advantages, provided they are valuable, scarce, inimitable, and irreplaceable (Bhandari et al., 2020; Barney et al., 2011). In this study, RCT allows us to examine how content creation, self-efficacy, and access to resources influence women's entrepreneurial intentions.

Women entrepreneurs can identify opportunities and secure resources for their success. Content creation involves generating relevant information (Vera et al., 2024; Pulizzi, 2012), using online platforms to attract audiences. Quality content enhances competitiveness and entrepreneurial intentions, as the perception of creativity can lead to business opportunities (Bhatta et al., 2024).

Confidence in skills refers to women entrepreneurs' belief in their ability to start businesses. A lack of confidence and support can limit female entrepreneurship, while self-efficacy influences the intention to start businesses and engage in key activities necessary for success (Llados-Masllorens & Ruiz-Dotras, 2021; Bandura, 1978).

Access to financial, technological, and human resources is essential, but women face barriers such as patriarchal values and less access to technology and financial services. These inequalities restrict their ability to establish and expand businesses. Access to finance, financial literacy, and technical know-how are vital to empower women and ensure sustainable growth (Bryan et al., 2024; Calanchez Urribarri et al., 2022).

In this area, the following hypotheses are put forward:

H_4: Entrepreneurship intentions have a positive impact on confidence in skills.

H_5: Entrepreneurship intentions have a positive impact on female empowerment.

H_6: Entrepreneurial intentions have a positive impact on entrepreneurial motivation.

H_7: Entrepreneurship intentions have a positive impact on the perception of opportunities.

Female Empowerment Theory and Its Relationship to Support Networks, Entrepreneurial Intentions and Perceived Opportunities

Female empowerment is a multifaceted social process that enables women to control their lives and communities by acting on issues they consider important (Bayeh, 2016). According to Huis et al. (2017), it involves gaining the power to make strategic decisions in contexts where this power had previously been denied to them. Kabeer's (1999) and Rowlands' (1995) Theory of Female Empowerment is key to understanding how control, access, and agency influence women's entrepreneurial intentions and behaviors.

This theory identifies three dimensions: access to resources, which includes financial capital, education, and support networks, enabling women to market and grow their businesses (Bryan et al., 2024; Calanchez Urribarri et al., 2022; Njuki et al., 2022); control of resources, which enhances their participation in important decisions and contributes to their well-being; and agency, which is the ability to set and achieve goals, managing their lives (Quisumbing et al., 2023). Female Empowerment Theory provides a robust framework for analyzing how these dimensions influence women's entrepreneurial intentions, where support networks and perceived opportunities are crucial.

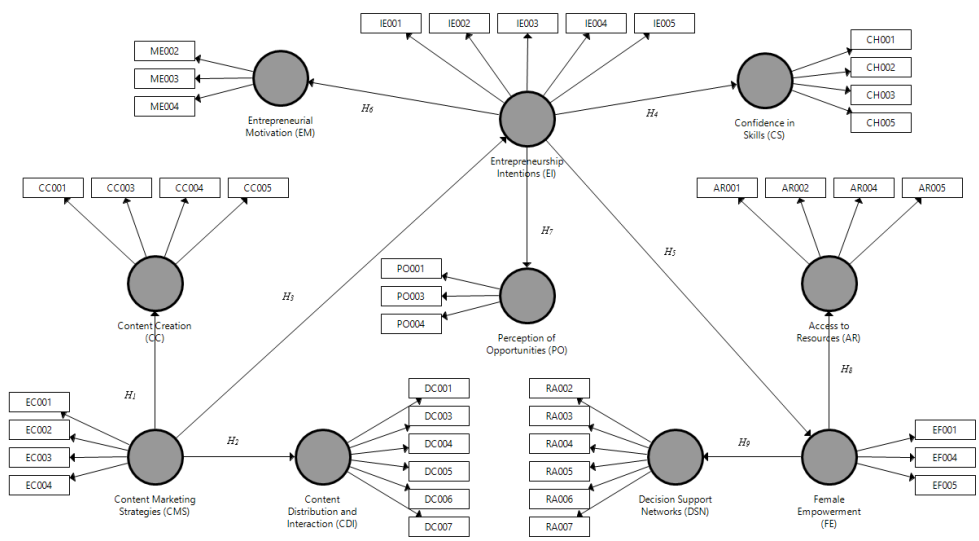
H_8: Female empowerment has a positive impact on access to resources.

H_9: Female empowerment has a positive impact on support networks in decision-making.

H_{10}: Content marketing strategies positively influence female empowerment through entrepreneurial intentions.

Figure 1 is presented below, illustrating the conceptual model that represents the main factors influencing the entrepreneurial intentions (EI) of university women in Peru's contemporary digital context. This theoretical framework integrates several interrelated constructs: entrepreneurial motivation (EM), confidence in skills (CS), content creation (CC), content distribution and interaction (CDI), content marketing strategies (CMS), perception of opportunities (PO), access to resources (AR), entrepreneurial intentions (EI), decision support networks (DSN), and female empowerment (FE). As visualized in the model, Content Marketing Strategies (CMS) are posited as a key antecedent, directly influencing Entrepreneurial Intentions (EI) and impacting EI through Content Creation (CC) and Content Distribution & Interaction (CDI), drawing upon the Theory of Planned Behavior. In turn, Entrepreneurial Intentions (EI) are hypothesized to be central, affecting outcomes such as Confidence in Skills (CS) and Female Empowerment (FE). Finally, the model proposes that Female Empowerment (FE) facilitates Access to Resources (AR) and Decision Support Networks (DSN), aligning with Empowerment Theory and the Resource-Based View. This includes a key hypothesized mediation path (H10) linking initial strategies (CMS) to final empowerment (FE) via entrepreneurial intentions (EI).

Figure 1: Conceptual model



Source: Own elaboration

Methodology

The research employed a quantitative approach with an explanatory scope and cross-sectional design to analyze the mediating influence of content marketing strategies and female empowerment on the entrepreneurial intentions of female university students in Peru, utilizing structural equation modeling (SEM). The target population consisted of 2,500 students from various majors at a private university in Lima during the 2024-2025 academic period, excluding males. Simple random probability sampling was applied, resulting in a necessary sample of 334 students; however, 668 students were surveyed to improve representativeness (Hernández et al., 2024; Hair et al., 2021).

Data were collected using a self-administered questionnaire in Google Forms, which was validated by experts in digital marketing, female empowerment, and business management. The questionnaire was reduced from 50 to 40 items following this validation process. The reliability of the questionnaire was assessed using Cronbach's alpha coefficient ($\alpha = 0.979$) and McDonald's ω coefficient ($\omega = 0.979$), both of which indicated excellent reliability. The items were scored on a 5-point Likert scale (Arias, 2023).

Data analysis was performed using SmartPLS 4.0, which is suitable for small samples and non-normal data. Preliminary tests were performed, including Harman's one-factor test, which revealed that the first factor explained 48.5% of the variance. The Kaiser-Meyer-Olkin (KMO) test showed an index of 0.954, and Bartlett's test of sphericity confirmed sampling adequacy. Metrics such as Mean Variance Extracted (MVE) and composite reliability were calculated to assess construct validity (Hair et al., 2021).

The SEM analysis was developed in two stages: the first assessed the reliability and validity of the constructs, and the second focused on structural model estimation and hypothesis analysis, evaluating the coefficients of determination (R^2) and effect sizes (f^2). Although SEM does not require multivariate normality, the distribution of the data was checked, confirming that they did not follow a normal distribution without affecting the validity of the model (Hair et al., 2022).

Finally, the study adhered to the university's Code of Ethics for Research, respecting the rights of participants and ensuring confidentiality and informed consent.

Results and Discussion

Results

The results present the main demographic, academic, and behavioral characteristics of the participants first. The findings show that most of the students are in advanced stages of their academic training, with 46.8% in final cycles (23-24 years old) and 28.2% as non-traditional students (25 years or older). 44.1% study Administration and Entrepreneurship, and 31.1% International Business, indicating a focus on management. In terms of the academic cycle, 45.4% are in cycles 7-8, and 27.3% are in cycles 9-10. In terms of work, 42.8% combine study with part-time work (26-35 hours per week) and 27.6% work full-time, evidencing a strong work commitment.

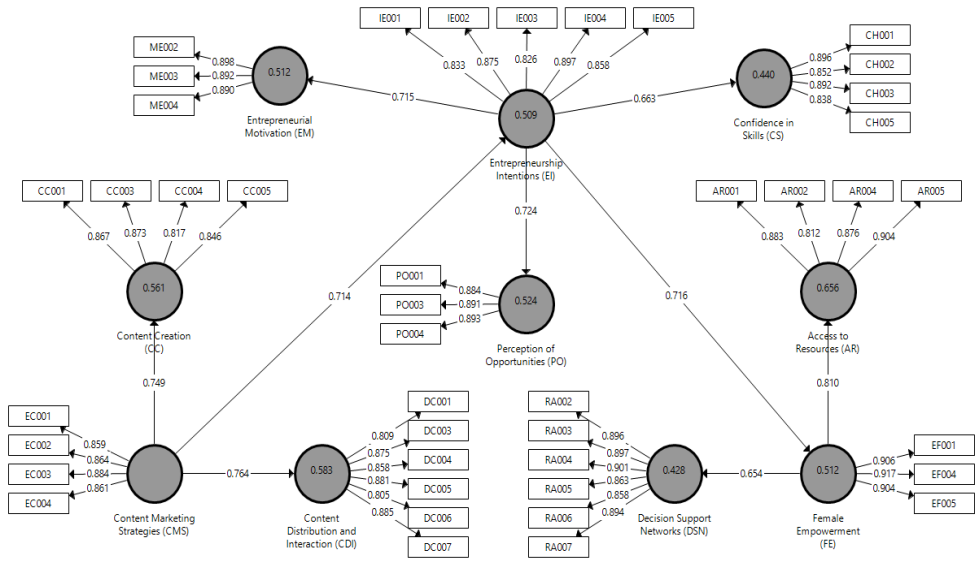
The motivation to start a business is based on family tradition (37.8%) and social impact (28.8%), suggesting that personal and social factors are key drivers. As for digital content, specialized blogs (37.3%) and professional social networks (28.3%) are the most consumed sources, reflecting a preference for practical information. Participants dedicate between 1 and 3 hours a day to content related to entrepreneurship, with a notable interest in female entrepreneurship topics (30.4% of participants are interested).

TikTok (36.9%) and LinkedIn (28.0%) are the most used platforms for professional development. In terms of family income, 35.3% comes from households with incomes between S/. 5,001 and S/. 7,500, and 32.0% between S/. 7,501 and S/. 10,000, indicating a predominance of medium and high socioeconomic levels. The data reflect a population mostly in advanced stages of academic training, with a marked interest in entrepreneurship and an active use of digital tools for their professional development.

On the other hand, the Structural Model (Figure 2) is presented, which illustrates the hypothesized structural relationships between the study constructs. This model enables the visualization of the proposed direct and indirect connections between key variables, providing a conceptual map of the causal pathways that will be empirically tested through SEM analysis. The graphical representation details the overall architecture of how the variables are postulated to interact sequentially within the theoretical framework. This figure provides a visual basis for understanding the model's structure before examining the specific quantitative results in Table 1, which

will assess the magnitude and statistical significance of the posited relationships.

Figure 2: Model Estructural



Source: Own elaboration

The results of the internal model are presented in Table 1 below, which includes the coefficients of determination (R^2) and effect sizes (f^2) for each endogenous variable. These results are essential to evaluate the predictive capacity of the model and the relevance of each predictor variable to the corresponding endogenous variables (Hair et al., 2021).

Table 1 presents the results of R^2, Adjusted R^2, and Effect Size (f^2), revealing significant findings about the structural relationships of the model. According to Hair et al. (2021), R^2 values are classified as substantial (> 0.75), moderate (0.50 - 0.75), and weak (0.25 - 0.50). AR shows the highest R^2 of the model at 0.656, indicating moderate-high explanatory power. CDI has an R^2 of 0.583 and CC an R^2 of 0.561, which are considered moderate and satisfactory for research in the social sciences.

Table 1: Quality Indicators of the Structural Model R², Adjusted R² and f²

Endogenous Variable	R^2	R^2 adjusted	Predictor variable	f^2
AR	0.656	0.655	-	-
CS	0.440	0.439	IE	0.785
CC	0.561	0.560	EMC	1.277
CDI	0.583	0.583	EMC	1.399
FE	0.512	0.512	AR	1.904
EI	0.509	0.509	FE	1.051
EM	0.512	0.511	IE	1.048
PO	0.524	0.524	IE	1.102
DSN	0.428	0.427	FE	0.748

Source: Prepared by the author based on the results of the Smart PLS Software version 3.2.9

The variables FE, EM, and PO have similar R^2 values (0.512, 0.512, and 0.524, respectively), exceeding the minimum recommended threshold. EI shows an R^2 of 0.509, indicating a moderate level of explanatory power (Hair et al., 2021).

Regarding the effect sizes (f^2), Cohen (1988) states that values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively. The RA → EF relationship has the largest effect size ($f^2 = 1.904$), classified as very large, indicating a significant influence of RA on FE. CME has important effects on CDI ($f^2 = 1.399$) and CC ($f^2 = 1.277$), considered large in the context of PLS-SEM models.

EF also demonstrates a substantial effect on EI ($f^2 = 1.051$), while EI significantly influences PO ($f^2 = 1.102$) and EM ($f^2 = 1.048$). Additionally, the FE → DSN ($f^2 = 0.748$) and EI → CS ($f^2 = 0.785$) relationships show moderate-high effects.

These results suggest a robust model with significant structural relationships. The R^2 values indicate satisfactory explanatory power, while the f^2 effect sizes reveal strong relationships between the constructs, supporting the model's relevance in understanding the dynamics between female empowerment, content marketing strategies, and entrepreneurial intentions.

Table 2: Discriminant Validity: FL and HTMT

Var.	AR	CS	CC	CDI	FE	CMS	EI	EM	PO	DSN
AR	0.869	0.758	0.836	0.798	0.891	0.735	0.816	0.890	0.829	0.895
CS	0.686	0.870	0.657	0.572	0.721	0.548	0.728	0.836	0.799	0.776
CC	0.736	0.586	0.851	0.874	0.649	0.846	0.870	0.765	0.736	0.661
CDI	0.727	0.524	0.792	0.853	0.657	0.831	0.811	0.703	0.668	0.603
FE	0.810	0.648	0.574	0.597	0.909	0.584	0.789	0.739	0.687	0.706
CMS	0.653	0.488	0.749	0.764	0.520	0.867	0.792	0.708	0.660	0.620
EI	0.736	0.663	0.779	0.748	0.716	0.714	0.858	0.790	0.812	0.691
EM	0.791	0.739	0.672	0.637	0.656	0.628	0.715	0.893	0.897	0.892
PO	0.729	0.705	0.644	0.603	0.606	0.581	0.724	0.785	0.890	0.827
DSN	0.829	0.716	0.602	0.568	0.654	0.570	0.643	0.807	0.747	0.885

Source: Own elaboration

Table 2 presents the analysis of discriminant validity, evaluated using the Fornell-Larcker criteria and the HTMT (Heterotrait-Monotrait Ratio) index. The values in the main diagonal, which correspond to the square root of the AVE (Average Variance Extracted), range between 0.851 and 0.909, indicating adequate internal consistency of the constructs. These values exceed the correlations between constructs, thus complying with the requirement of discriminant validity (Fornell & Larcker, 1981; Henseler et al., 2015). The Female Empowerment construct has the highest value (0.909), followed by Entrepreneurial Motivation (0.893), which reinforces the convergence of the indicators.

Most of the constructs meet the Fornell-Larcker criterion, since the square root of the AVE is greater than the correlations between constructs, guaranteeing discriminant validity. However, some correlations are higher, which could indicate a closer theoretical relationship between certain constructs (Henseler et al., 2015; Rönkkö & Evermann, 2013).

In the analysis of the HTMT index, five relationships were identified that exceed the threshold of 0.85, although none surpass the critical limit of 0.90, thus ensuring an acceptable discriminant validity. This indicator is more sensitive to detecting validity issues in variance-based models (Henseler et al., 2015). The highest relationships are observed between AR → DSN (0.895), EM → PO (0.897), and EM → DSN (0.892), remaining within acceptable limits.

In conclusion, the model demonstrates adequate discriminant validity based on the criteria of the square root of the AVE and the HTMT index, recognized as statistical standards in the analysis of structural equation models (Fornell & Larcker, 1981; Henseler et al., 2015).

Table 3: Analysis of Factor Loads and Variance Inflation Factors (VIF) in the Measurement Model

Variable	**VIF**	**Factor Load**	**Variable**	**VIF**	**Factor Load**
Access to Resources (AR)			Content Marketing Strategies (CMS)		
AR001	2.464	0.883	EC001	2.400	0.859
AR002	2.055	0.812	EC002	2.490	0.864
AR004	2.696	0.876	EC003	2.565	0.884
AR005	3.005	0.904	EC004	2.292	0.861
Confidence in Skills (CS)			Entrepreneurial Intentions (EI)		
CH001	3.030	0.896	IE001	2.392	0.833
CH002	2.204	0.852	IE002	2.839	0.875
CH003	2.661	0.892	IE003	2.203	0.826
CH005	2.110	0.838	IE004	3.230	0.897
			IE005	2.536	0.858
Content Creation (CC)			Entrepreneurial Motivation (EM)		
CC001	2.333	0.867	ME002	2.178	0.898
CC003	2.336	0.873	ME003	2.486	0.892
CC004	1.915	0.817	ME004	2.435	0.890
CC005	2.081	0.846	Perception of Opportunities (PO)		
			PO001	2.207	0.884
Content Distribution and Interaction (CDI)			PO003	2.419	0.891
			PO004	2.234	0.893
DC001	2.625	0.809	Decision support networks (DSN)		
DC003	3.056	0.875	RA002	3.771	0.896
DC004	3.421	0.858	RA003	3.766	0.897
DC005	3.258	0.881	RA004	3.968	0.901
DC006	2.543	0.805	RA005	2.688	0.863
DC007	3.401	0.885	RA006	2.977	0.858
			RA007	3.732	0.894
Female Empowerment (FE)					
EF001	2.648	0.906			
EF004	2.939	0.917			
EF005	2.586	0.904			

Source: Own elaboration

Table 3 presents the analysis of factor loads, which reflect a solid and reliable measurement structure for all constructs of the model. All loads exceed the critical threshold of 0.708, established by Hair et al. (2021), confirming the convergent validity of the indicators.

Female Empowerment stands out with loads between 0.904 and 0.917, evidencing a strong relationship with its indicators. The Decision Support Networks show robust loads between 0.858 and 0.901. Content Marketing Strategies have high loads ranging from 0.859 to 0.884, reflecting an excellent representation of the construct.

On the other hand, Content Creation has values between 0.817 and 0.873, while Content Distribution and Interaction range between 0.805 and 0.885, demonstrating solid convergent validity. Entrepreneurial Intentions and Entrepreneurial Motivation also show high loads, suggesting excellent reliability of the indicators.

The constructs of Access to Resources and Confidence in Skills have loads that exceed 0.70, confirming their convergent validity. In general, the factor loads in all constructs demonstrate the quality of the measurement model, supporting its reliability and convergent validity (Magno et al., 2022).

The analysis of Variance Inflation Factors (VIF) supports the validity of the model, with values ranging from 1.915 to 3.968, all below the critical threshold of 5, indicating the absence of significant collinearity problems (Hair et al., 2021). Support Network indicators have the highest VIF values but remain within the acceptable range.

The indicators of Entrepreneurial Intentions and Entrepreneurial Motivation also show manageable values, ensuring adequate independence between the indicators. Low FIV values, such as those of CC004 and CC005, indicate an excellent distinction between the indicators and confirm their unique contribution to the construct (Magno et al., 2022).

Therefore, the result of the factor loads and the VIF values confirms that the measurement model is robust and reliable. High loads ensure strong convergent validity, while VIF values within the acceptable range ensure the absence of collinearity problems, strengthening the theoretical and empirical basis for structural analysis of the model.

Table 4: Path Coefficient Analysis and Hypothesis Validation

Hypothesis	Relation	Path Coefficient	t-value	p-value
H_1	Content marketing strategies → Content creation.	0.749	38.756	p < 0.05, Accepted
H_2	Content marketing strategies → Content distribution and interaction.	0.764	49.500	p < 0.05, Accepted
H_3	Content marketing strategies → Entrepreneurship intentions.	0.714	29.085	p < 0.05, Accepted
H_4	Entrepreneurship intentions → Confidence in skills	0.663	23.662	p < 0.05, Accepted
H_5	Entrepreneurship intentions → Female empowerment.	0.716	33.508	p < 0.05, Accepted
H_6	Entrepreneurial intentions → Entrepreneurial motivation	0.715	34.203	p < 0.05, Accepted
H_7	Entrepreneurship intentions → Perception of opportunities	0.724	29.502	p < 0.05, Accepted
H_8	Female empowerment → Acceso a recursos	0.810	51.748	p < 0.05, Accepted
H_9	Female empowerment → Decision-making support networks	0.654	23.851	p < 0.05, Accepted
H_{10}	Content marketing strategies → Entrepreneurship intentions → Female empowerment.	0.511	20.842	p < 0.05, Accepted

Source: Own elaboration

The results of the structural equation analysis, presented in Table 4, confirm that all hypotheses were accepted ($p < 0.05$), thereby validating the

proposed model. Content marketing strategies significantly influence several variables. The strongest correlation is with the distribution and interaction of the content (coefficient of 0.764, t = 49.500, *H2*, $p < 0.05$), which shows that these strategies attract and engage the public, as indicated by Pulizzi (2012) and Hollebeek and Macky (2019). They also have a positive impact on content creation (coefficient of 0.749, t = 38.756, *H1*, $p < 0.05$), strengthening relationships with the audience.

In addition, they affect entrepreneurial intentions (coefficient of 0.714, t = 29.085, *H3*, $p < 0.05$), supported by Ajzen's (1991) Theory of Planned Behavior, which suggests that attitudes and norms influence intention. This allows women entrepreneurs to strengthen their self-efficacy and better plan their activities.

Entrepreneurial intentions also impact confidence in skills (*H4*, $\beta = 0.663$, t = 23.662, $p < 0.05$), female empowerment (*H5*, $\beta = 0.716$, t = 33.508, $p < 0.05$) and entrepreneurial motivation (*H6*, $\beta = 0.715$, t = 34.203, $p < 0.05$). These findings coincide with Carsrud and Brännback (2011), who state that greater motivation increases the probability of starting a business. The perception of opportunities is also influenced (coefficient of 0.724, t = 29.502, *H7*, $p < 0.05$), as Shane and Venkataraman (2007) explain.

Female empowerment is key, showing a high correlation with access to resources (coefficient of 0.810, t = 51.748, *H8*, $p < 0.05$), which allows women to overcome structural barriers (Bryan et al., 2024). It also influences decision-making support networks (coefficient of 0.654, t = 23.851, *H9*, $p < 0.05$), supported by Rowley (2008).

Finally, entrepreneurial intentions mediate between marketing strategies and female empowerment (coefficient of 0.511, t = 20.842, *H10*, $p < 0.05$), indicating an indirect effect of marketing strategies on empowerment. This validates the relationship between marketing, entrepreneurial motivation, and female empowerment, with significant empirical support.

Discussion

The findings of the structural equation analysis confirm that all hypotheses are valid ($p < 0.05$), which supports the proposed model on the interactions between female empowerment, entrepreneurial intentions, and content marketing strategies.

The H_1 hypothesis reveals a positive effect of content marketing strategies on content creation (coefficient of 0.749), aligning with Julaeha (2024), which emphasizes the importance of high-quality content in fostering strong relationships with the public. Mufadhol et al. (2024) also reinforce that relevant content increases consumer engagement and loyalty.

For H_2, it is confirmed that these strategies positively affect the sharing and interaction of content (coefficient of 0.764), supported by Pulizzi (2012) and Hollebeek and Macky (2019), who argue that relevant content generates high interaction. Chaffey and Smith (2014) indicate that well-designed campaigns can increase consumer engagement in digital by up to 40%.

In H_3, it is observed that marketing strategies have a positive influence on entrepreneurial intention (coefficient of 0.714), which is explained by Ajzen's Theory of Planned Behavior (1991). This strengthens the self-efficacy and motivation of women entrepreneurs (Dalimunthe et al., 2025).

Hypothesis H_4, linking entrepreneurial intentions and confidence in skills, is confirmed with a coefficient of 0.663, aligning with Bandura's (1978) self-efficacy theory, which highlights the importance of confidence in overcoming challenges. Women entrepreneurs with higher confidence are more likely to start new businesses. Paunovic and Musial (2024) point out that self-efficacy is a key factor in entrepreneurial intention, especially in women who participate in entrepreneurship education programs.

Hypothesis H_5 suggests that entrepreneurial intentions have a positive impact on female empowerment (coefficient of 0.716), as supported by Widiastuti et al. (2024), who note that empowered women tend to make better strategic decisions. Bryan et al. (2024) highlight that empowerment is linked to access to resources and support networks.

H_6 confirms that entrepreneurial intentions have a positive influence on entrepreneurial motivation (coefficient of 0.715). Carsrud and Brännback (2011) explain that greater motivation increases the probability of developing business plans. Manjaly et al. (2022) state that women's motivation for entrepreneurship arises from both external factors and their self-assessment and passion for entrepreneurship. Hence, motivation is crucial for business success, driving entrepreneurs to persist and adapt.

Hypothesis H_7 confirms that entrepreneurial intentions affect the perception of opportunities (coefficient of 0.724), which is essential for business emergence, as indicated by Shane and Venkataraman (2007). Motivated and confident entrepreneurs are more likely to spot entrepreneurial opportunities.

H_8 shows that female empowerment has a positive impact on access to resources (coefficient of 0.810), supporting the Theory of Resource Capabilities (Bhandari et al., 2020; Barney et al., 2011). Empowered women have more access to financial and technological resources, which allows them to develop key skills for their businesses (Widiastuti et al., 2024).

Hypothesis H_9 posits that female empowerment influences decision-making support networks (coefficient of 0.654), a finding supported by Rowley (2008) and Kabeer (2021), who emphasize the significance of these networks for business success.

At last, H_{10} validates that content marketing strategies influence female empowerment through entrepreneurial intentions (coefficient of 0.511), confirming the theoretical connection of the model. Dwivedi et al. (2021) highlight the relevance of intentions as mediators in business behavior.

These findings have practical implications, suggesting the need for content marketing strategies that foster self-efficacy and entrepreneurial intentions. They also underscore the importance of accessing resources and support networks to empower women entrepreneurs. However, the study has certain limitations that suggest directions for future research.

The main restriction lies in the sample, which is limited to students from a private university in Lima, affecting generalizability. It is recommended that future samples be expanded to include diverse institutions (public and private) and regions of Peru, using, for example, stratified sampling to better capture socioeconomic and geographic diversity.

Similarly, it is limited by the exclusive reliance on self-administered questionnaires, which are susceptible to self-report bias. To strengthen the findings, future studies could benefit from mixed approaches, integrating qualitative methods such as interviews to triangulate and deepen the understanding of students' perceptions and experiences.

Additionally, it is recognized that the measurement of empowerment focuses on perceptual indicators. Further research could employ multidimensional scales that address specific aspects such as autonomy, access, and control of resources, offering a more comprehensive assessment.

Finally, the cross-sectional design of the study offers a static perspective; the implementation of longitudinal designs could allow for examining the temporal dynamics of the relationships between content marketing, entrepreneurial intentions, and empowerment, in addition to strengthening inferences about causality.

Conclusion

The findings of this study confirm that content marketing strategies are crucial for creating and distributing relevant content, which in turn increases audience engagement and enhances women's entrepreneurial intentions. This highlights the need to develop strategies that not only capture the audience's attention but also create real, lasting connections. Organizations are advised to invest in content that emphasizes relevance, quality, and direct consumer engagement, especially on digital platforms.

The study also indicates that entrepreneurial intentions have a positive impact on confidence in skills, female empowerment, entrepreneurial motivation, and the perception of opportunities. This underscores the importance of strengthening programs and policies to support women's entrepreneurship, promoting women's self-efficacy and their ability to identify and take advantage of opportunities. It is suggested to conduct training sessions in business skills and leadership, as well as to facilitate access to financial, technological, and social resources.

Female empowerment is a key component of the model, improving access to valuable resources and enhancing the ability to network and make informed decisions. This finding implies that organizations should prioritize programs that promote gender equality and access to resources that favor women's business growth. Additionally, it is suggested to promote support networks among entrepreneurs for the exchange of knowledge and opportunities.

Indirect effects of content marketing strategies on female empowerment through entrepreneurial intention are verified, validating their inclusion in entrepreneurship support programs. Both public and private institutions must collaborate in the dissemination of success stories and strategies for female entrepreneurship. Finally, the study highlights the importance of investigating how relationships are built in different cultural and economic contexts, as well as other determinants such as technological progress and social interaction. Longitudinal studies would be useful to assess the long-term effects of content marketing strategies on women's entrepreneurship and empowerment. Future studies in this area will contribute to a more comprehensive understanding and more effective interventions for women entrepreneurs.

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ORIGINAL SCIENTIFIC PAPER

Formulating Strategies for Empowering Women Fishery Entrepreneurs toward Sustainable Blue Entrepreneurship

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A B S T R A C T

This study develops a defensive strategy framework for women in the fisheries sector, focusing on their pursuit of sustainable blue entrepreneurship. The research employs a quantitative SWOT analysis, where data were collected through structured questionnaires, document reviews, and observations. Respondents evaluated internal and external factors using a Likert scale, and the results positioned women entrepreneurs in the defensive quadrant, highlighting the urgency of strategic responses to external threats and internal weaknesses. Findings emphasize three key dimensions: (1) resilience and vulnerability management to strengthen adaptive capacity, (2) social capital and collective action to reduce dependency and enhance cooperative power, and (3) adaptive co-management with quadruple helix collaboration, integrating community, academia, government, and private sector. These dimensions form a structured

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defensive strategy that ensures both survival and long-term sustainability. The novelty of this study lies in applying quantitative SWOT within a gender-sensitive framework for the blue economy. Practically, the results guide policymakers and stakeholders in empowering women entrepreneurs and reinforcing resilient coastal livelihoods.

KEYWORDS: *women entrepreneurs, fisheries, blue economy, sustainability, swot analysis, defensive strategy*

Introduction

The marine and fisheries sector plays a strategic role in the Indonesian economy. It contributes to more than a quarter of the national gross domestic product (GDP), equivalent to more than USD 256 billion per year, and covers about 65% of the country's territory (Ayu et al., 2025). The sea is not only a source of food, but also the main source of livelihood for millions of coastal communities. However, the facts show that about 5.23 million fishers in Indonesia are still categorized as poor, especially in coastal areas (Putra et al., 2021). This imbalance indicates that the enormous potential of the marine sector has not yet been fully realized to improve the well-being of coastal communities (Anand et al., 2021). Women fishers play an important role in supporting the economy of coastal households (Swathi Lekshmi et al., 2022). The low income of fishers requires the contribution of female fishers (wives) to improve their welfare. They are not only involved in pre-production, production, and post-production, but also run small businesses such as selling fresh fish and processing marine products. This role is not only an additional source of income, but also a mainstay of the family economy, especially when the income from fishing is insufficient.

The concept of sustainable blue entrepreneurship is important in this context. Blue entrepreneurship not only promotes economic sustainability but also pays attention to the protection of the marine environment and the social empowerment of coastal communities (Evans et al., 2023; Rahaman et al., 2024). Globally, blue entrepreneurship initiatives, driven by innovation, marine technology, and green investment, continue to grow. However, studies on blue entrepreneurship development strategies, especially those focusing on women fishers, are still very limited (Figueiredo et al., 2023). Demak District in Central Java, Indonesia, is a coastal area with great potential yet complex challenges. Despite a strong patriarchal culture, a fisherwomen's community of over 100 members has

emerged, showing real opportunities for structured and sustainable entrepreneurial development. This highlights the gap between the maritime sector's vast potential and coastal poverty, as well as the limited research on strategies to develop women fishers into sustainable blue entrepreneurs.

Women entrepreneurs play an important role in economic growth, as more than 60% of MSMEs in Indonesia are run by women (BPS-Statistics Indonesia, 2021; Sugiyanto et al., 2021). Due to the significant role and contributions of women fishing entrepreneurs, it is essential to harness the potential of these businesses to support their continued success. Sustainable blue entrepreneurship is expected to address the complex issues facing coastal communities, including economic, social, and environmental issues. Blue entrepreneurship has increased in recent years, as evidenced by the rise of accelerators, innovation awards, and investment companies that support marine technology and start-ups (Dijkstra et al., 2022). This study aims to formulate strategies for developing the entrepreneurial potential of women fishers through a SWOT analysis, identifying internal and external factors that enhance business competitiveness and promote sustainable blue entrepreneurship, thereby strengthening the economic, social, and environmental resilience of coastal communities.

Literature Review

Fisherwomen Entrepreneurs

Women fishers play an important role in the fisheries value chain, from pre-production to production and post-production (Chambon et al., 2024; Roy et al., 2023).In many coastal areas, they are involved in the sale of fresh fish, the processing of marine products, and the distribution of these products to local markets. The economic contribution of fisherwomen is often the mainstay of their families, especially when income from fishing declines due to seasonal factors, weather, or fishing policies (Roy et al., 2023). More than 60% of MSMEs in Indonesia are run by women, indicating their strategic role in local economic development (Sugiyanto et al., 2024; Sugiyanto & Wijayanti, 2023, 2024). However, women fishers' businesses are still generally informal, have low production capacity, and minimal access to capital and technology (Selim et al., 2025)

The Concept of Sustainable Blue Entrepreneurship

Blue entrepreneurship is an entrepreneurial approach that utilises marine resources sustainably, taking into account economic, social, and environmental aspects (Dijkstra et al., 2022; Elston et al., 2024). This concept has evolved in line with the growing global interest in the sustainable blue economy, which promotes marine technology innovation, green investment, and ecosystem-based resource management (Amon et al., 2022). Sustainable blue entrepreneurship has the potential to alleviate poverty in coastal regions while preserving marine ecosystems, but its success depends heavily on strengthening entrepreneurs' capacity, market access, and policy support (Evans et al., 2023; Rahaman et al., 2024).

SWOT Analysis as a Strategy Formulation Tool

SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) is a strategic method for identifying internal and external factors that influence the performance of an organization or company (Mardiyana et al., 2022; Sabado, 2025). In the context of fisherwomen's entrepreneurship, SWOT analysis can identify strengths such as seafood processing skills and community networks, weaknesses such as limited capital and technology, opportunities such as trends in processed fishery products, and threats such as price volatility and climate change (Rahmiyati & Rachmawati, 2023). The use of SWOT analysis with scoring methods enables the prioritization of appropriate strategies, both offensive and defensive (Fan et al., 2023; Mihajlović et al., 2024).

The Quadruple Helix Framework in Coastal Community Empowerment

The quadruple helix model involves four key actors (academics, government, business, and society) in the process of innovation and strategy development (Carayannis et al., 2022; Morawska-Jancelewicz, 2022). When empowering fishers, this collaboration is important to ensure knowledge transfer, regulatory support, improved market access, and community empowerment (Rashid et al., 2024). Integrating the quadruple helix into the development strategy for sustainable blue entrepreneurship enables the creation of inclusive, adaptable, and highly competitive solutions (Loizidou et al., 2024; Sampaolo et al., 2021).

Materials and Methods

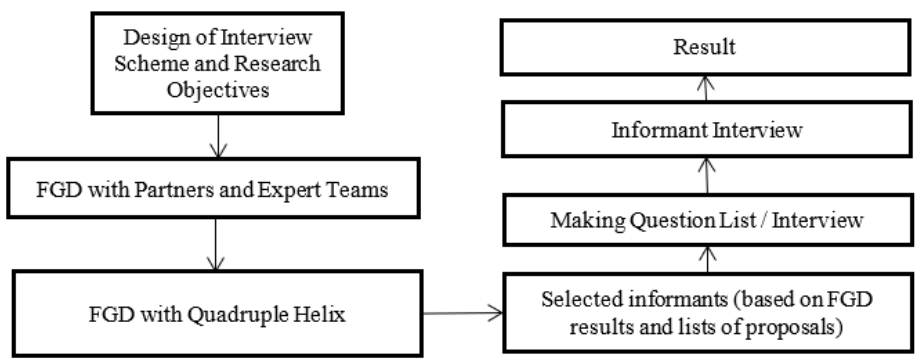
Research Design

This study employs a quantitative design with a SWOT analysis to map internal (strengths and weaknesses) and external (opportunities and threats) factors influencing the entrepreneurial potential of women fishers, with the results guiding the prioritization of strategies for sustainable blue entrepreneurship development.

Informant Selection

Informants were selected through purposive sampling based on the Quadruple Helix Framework, comprising four key groups: academics involved in non-profit coastal development programs, government representatives overseeing coastal and entrepreneurship initiatives, women fishers managing maritime enterprises from production to marketing, and community members from women fishers' groups in coastal areas of Demak District.

Figure 1: Steps for Selecting Informants



Source: Authors' elaboration

This study involved 30 informants: five academics, five government representatives, fifteen businesswomen, and five community members, purposively selected to represent all Quadruple Helix stakeholders. Fisherwomen were included if they had run a maritime business for at least three years, lived in the Demak District, and actively participated in

women's empowerment groups. Most were aged 30–50, had completed secondary education, and earned IDR 2–4 million monthly. Rooted in Javanese coastal traditions, they balance household and fishing roles, shaping their entrepreneurial decisions and business participation.

Data Collection

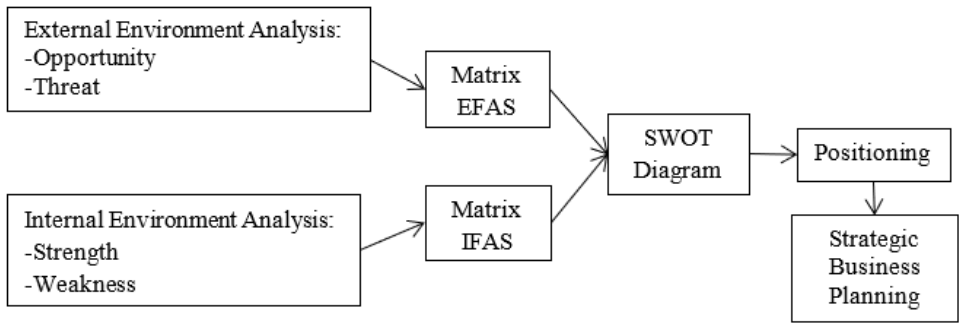
Data were collected through structured questionnaires, observation, and documentation. The 20-item questionnaire measured perceptions of strengths, weaknesses, opportunities, and threats on a 4-point Likert scale (1 = very low impact, 4 = very high impact). Observations over two months in three Demak villages (Wedung, Bonang, and Sayung) monitored business activities, coastal conditions, and community interactions, while documentation reviewed regional plans, cooperative reports, and fisheries statistics. Internal factors were identified from local business capacities, resources, and constraints of women fishers, and validated through expert interviews. External factors were drawn from policy documents, market trends, and environmental data. A focus group with Quadruple Helix representatives ensured validity and relevance, followed by a pilot test with five female fishers to refine the questionnaire.

Data Analysis Procedures

The analysis was carried out in three steps:

1. Identify the SWOT factors: grouping the data into strengths, weaknesses, opportunities, and threats based on the questionnaire results, observations, and documentation studies.
2. Weighting and scoring: Assign a weighting (0–1) and a score (1–4) to each SWOT factor based on its degree of influence and then calculate the weighted score.
3. Strategy formulation – incorporate the results of the analysis into the SWOT matrix (EFAS and IFAS) to determine priority strategic alternatives for the development of women entrepreneurs in the fisheries sector towards sustainable blue entrepreneurship.

Figure 2: Model of Development Planning Strategy of Empowering Fisherwomen



Source: Authors' elaboration

Results and Discussion

Internal Environmental Factors

Fisherwomen have several strong and empirically proven internal advantages. First, traditional seafood processing skills and ancestral knowledge represent tacit knowledge that is difficult to replicate, giving local products an advantage (e.g., flavor, processing techniques, cultural uniqueness), which aligns with the resource-based view (RBV) of competitive advantage through local resources. The uniqueness of this product is also relevant to the concept of sustainable blue entrepreneurship, which consists of sustainably utilizing local marine resources while preserving cultural values (Elston et al., 2024; Kyvelou et al., 2025). The concept of the blue economy, which now places more emphasis on social and sustainable dimensions, opens up opportunities for value-added products such as these to gain market recognition and political support (Veríssimo et al., 2021).

Second, social capital, including family support, community solidarity, regular client networks, and active women's fishing groups, serves as the basis for organization, trust, and informal distribution mechanisms that support household microenterprises. The empowerment literature demonstrates that social capital enhances the collective capacity for information sharing, market access, and cooperation in production (Sugiyanto et al., 2021, 2024). Government/NGO practices that empower communities (e.g., cooperative education, coastal field schools) increasingly

facilitate the transformation of this social capital into more formal economic capacities (Bokayev et al., 2024).

Third, easy access to local raw materials, generational fishing experience, flexible working hours, and entrepreneurship are a combination of human capital and operational practicality that enables rapid adaptation to market opportunities (e.g., product diversification). Innovation in small-scale processing and collaboration with local partners increases adaptive capacity to survive in uncertain conditions (e.g., fluctuations in catch) (Petersen-Rockney et al., 2021). Shared practices between stakeholders (quadruple helix) also open up access to technical and market support if properly promoted (Sampaolo et al., 2021).

Table 1: Internal Factors Analysis Summary (IFAS)

Internal Factors	
Strength	**Weakness**
Traditional seafood processing skills	Limited access to financing
Family and social support	Weak financial management
Easy access to marine raw materials	Low digital literacy
Generations of fishing experience	Minimal formal education
High entrepreneurial spirit	Uncertified products
Active community of fisherwomen	Traditional production equipment
The uniqueness of local products	Dependent on middlemen
Flexible working hours	Inconsistent product quality
Small-scale processed innovations	The dual role of working women
Social capital of local groups	No training or mentoring
The strong commitment of fisherwomen	Low awareness of gender equality
Regular customer network	Lack of data and information on coastal businesses
Solidarity among communities	Sub-optimal business management
Partner/network collaboration	Decline in marine production
	Low gender participation in decision-making

Source: Authors' elaboration

Despite their rich social and cultural capital, women entrepreneurs in the fisheries sector face structural constraints that limit the scale and sustainability of their businesses. Limited access to finance and dependence on middlemen are problems associated with the center-periphery market

(Mittal & Raman, 2021). Formal financing often fails to reach informal microenterprises, resulting in low profit margins and weak bargaining power. This limits the ability to invest in more hygienic equipment or production capacity to meet modern market standards.

Weak financial management, sub-optimal governance, and a lack of data on coastal farms hinder planning and access to evidence-based aid programs or subsidies (Nashrullah et al., 2024). At the practical level, many government and NGO programs offer training, but weak data and governance limit long-term productivity gains. Although initiatives like the Maritime Village Program and Coastal Schools increasingly prioritize women's empowerment, challenges in implementation and affordability remain. Low digital literacy and minimal formal education limit the ability of economic actors to access digital markets, pricing information, or marketing platforms that can increase profit margins (Joseph et al., 2025). In the connected blue economy, limited digital access hinders entry into high-value markets, while the lack of product certification (hygiene, safety, halal) and outdated equipment restricts market reach and consistent quality.

Women's dual roles (as workers and homemakers) and low participation in decision-making limit women's time and space to aggressively develop businesses or take on leadership roles in economic networks (Franzke et al., 2022). This requires not only technical interventions (training, capital), but also normative interventions (gender mainstreaming, local policy change). A literature review shows that while there are empowerment initiatives, gender aspects are often not at the forefront of larger marine programs (Freeman & Svels, 2022).

External Factors Analysis Summary

Rising consumer demand for healthy, eco-friendly fishery products creates a value-added niche for hygienic and certified products (e.g., food/halal certification), offering fisherwomen opportunities for product differentiation (Nicolosi et al., 2021). Market digitalization and e-commerce expand access to urban and national markets, reducing reliance on middlemen and extending value chains. Government initiatives prioritizing the blue economy and women's empowerment, such as the Coastal Field School and Marine Tourism Village Program, support training, product branding, and ecotourism development (Rahaman et al., 2024). Partnership models (cooperatives, village-owned enterprises, CSR, university collaborations) and investor interest in innovation enhance access to capital,

technology, and markets. Certification and mentoring programs further strengthen market penetration when implemented collectively and systematically.

Table 2: External Factors Analysis Summary (EFAS)

External Factors	
Opportunity	**Threat**
Interest in healthy seafood products	Climate change disrupts the marine supply
Digital/online market opportunities	Competition from manufactured products
Support for business-strengthening programs	Fluctuating raw material prices
Access to training from universities/CSR	Significant occupational health risks
Tourism has the potential to promote local products	Inadequate infrastructure
Cooperation with cooperatives/other parties	Minimal legal protection for micro businesses
Demand for environmentally friendly products	Small local market
Product certification opportunities	The role of women is under-recognised
Investor interest in the business	Marine pollution and industrial waste
Synergy with larger MSMEs	Dependence on middlemen
Policy and regulatory support	Deteriorating environmental/ecosystem conditions
Implementation of gender equality and human rights	Fishing areas are becoming increasingly limited
Utilization of innovation and technology	

Source: Authors' elaboration

Ecological and market threats endanger business sustainability: (1) climate change and ocean warming alter fish distribution and productivity, reducing raw material supply, and (2) marine pollution and ecosystem degradation lower catch quality and volume (Martínez-Vázquez et al., 2021). These factors threaten small enterprises, while price fluctuations, poor post-harvest infrastructure, and weak legal protection limit women-owned businesses from accessing high-value markets. Additional barriers

include competition from other regions, health risks, and limited recognition of women's roles in decision-making. Mitigation requires climate adaptation, pollution control, infrastructure investment, market access improvement, and gender empowerment across the value chain.

Strategic Business Planning

Based on the EFAS and IFAS matrices, the analysis produced strength, weakness, opportunity, and threat scores of 2.82, 2.91, 1.84, and 3.71, respectively. These results guided the formulation of priority strategies for developing women fisher entrepreneurs toward sustainable blue entrepreneurship.

Table 3: Evaluation Matrix of Strength Factors

No	Internal factors (Strength)	Weight	Rating	Weight x Rating
S1	Traditional seafood processing skills	0.08	3	0.25
S2	Family and social support	0.12	2	0.24
S3	Easy access to marine raw materials	0.08	2	0.16
S4	Generations of fishing experience	0.06	3	0.19
S5	High entrepreneurial spirit	0.09	3	0.28
S6	Active community of fisherwomen	0.08	4	0.31
S7	The uniqueness of local products	0.04	3	0.13
S8	Flexible working hours	0.14	3	0.41
S9	Small-scale processed innovations	0.05	3	0.15
S10	Social capital of local groups	0.06	2	0.11
S11	The strong commitment of fisherwomen	0.07	3	0.22
S12	Regular customer network	0.06	3	0.18
S13	Solidarity among communities	0.03	3	0.09
S14	Partner/network collaboration	0.03	3	0.09
	Total	1.00		2.82

Source: Authors' elaboration

Table 4: Evaluation Matrix of Weakness Factors

No	Internal factors (Weakness)	Weight	Rating	Weight x Rating
W1	Limited access to financing	0.09	3	0.28
W2	Weak financial management	0.09	3	0.27
W3	Low digital literacy	0.07	3	0.21
W4	Minimal formal education	0.07	2	0.15
W5	Uncertified products	0.07	3	0.20
W6	Traditional production equipment	0.08	2	0.15
W7	Dependent on middlemen	0.07	3	0.22
W8	Inconsistent product quality	0.05	2	0.10
W9	The dual role of working women	0.11	4	0.44
W10	No training or mentoring	0.05	3	0.14
W11	Low awareness of gender equality	0.05	3	0.15
W12	Lack of data and information on coastal businesses	0.06	3	0.17
W13	Sub-optimal business management	0.05	3	0.14
W14	Decline in marine production	0.06	3	0.18
W15	Low gender participation in decision-making	0.04	3	0.12
	Total	1.00		2.91

Source: Authors' elaboration

Table 5: Evaluation Matrix of Opportunity Factors

No	External factors (Opportunity)	Weight	Rating	Weight x Rating
O1	Interest in healthy seafood products	0.09	2	0.18
O2	Digital/online market opportunities	0.09	1	0.09
O3	Support for business-strengthening programs	0.12	3	0.35
O4	Access to training from universities/CSR	0.09	2	0.19
O5	Tourism has the potential to promote local products	0.06	1	0.06
O6	Cooperation with cooperatives/other parties	0.07	2	0.13
O7	Demand for environmentally friendly	0.08	1	0.08

No	External factors (Opportunity)	Weight	Rating	Weight x Rating
	products			
O8	Product certification opportunities	0.09	2	0.18
O9	Investor interest in the business	0.05	1	0.05
O10	Synergy with larger MSMEs	0.07	2	0.14
O11	Policy and regulatory support	0.06	2	0.13
O12	Implementation of gender equality and human rights	0.08	2	0.16
O13	Utilization of innovation and technology	0.05	2	0.10
	Total	1.00		1.84

Source: Authors' elaboration

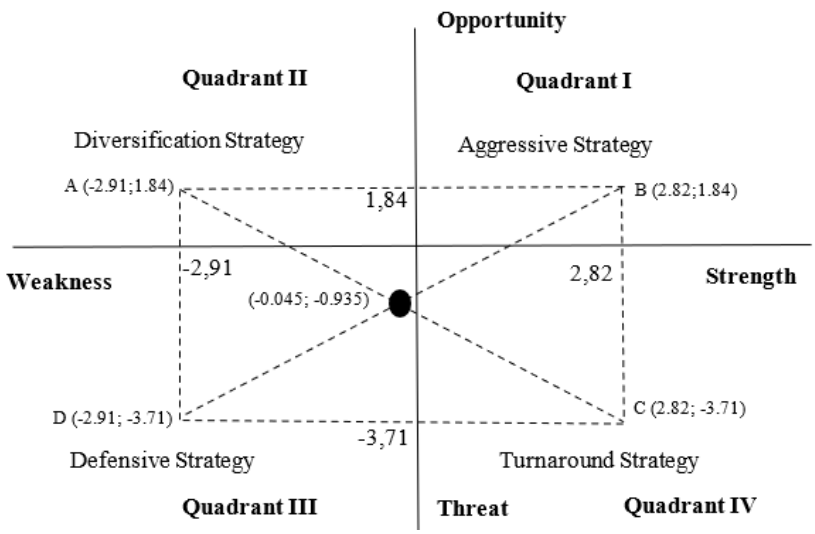
Table 6: Evaluation Matrix of Threat Factors

No	External factors (Threat)	Weight	Rating	Weight x Rating
T1	Climate change disrupts the marine supply	0.13	4	0.513
T2	Competition from manufactured products	0.05	3	0.144
T3	Fluctuating raw material prices	0.08	3	0.255
T4	Significant occupational health risks	0.08	4	0.314
T5	Inadequate infrastructure	0.11	4	0.423
T6	Minimal legal protection for micro businesses	0.06	4	0.224
T7	Small local market	0.07	3	0.221
T8	The role of women is under-recognized	0.08	4	0.333
T9	Marine pollution and industrial waste	0.11	4	0.449
T10	Dependence on middlemen	0.06	3	0.178
T11	Deteriorating environmental/ecosystem conditions	0.07	4	0.288
T12	Fishing areas are becoming increasingly limited	0.10	4	0.391
	Total	1.00		3.734

Source: Authors' elaboration

Based on the SWOT diagram, the strategic position for female entrepreneurs is in quadrant III. Quadrant III (weakness-threat) or defensive strategy. This position reflects internal weaknesses that are slightly more pronounced than its strengths, and external threats that outweigh the opportunities. A relevant strategy is to minimize weaknesses such as limited capital, technology, and market access while anticipating threats such as commodity price volatility, competition, climate change, and marine pollution. Possible approaches include strengthening corporate institutions, building marketing alliances, enhancing human resources capacity, and diversifying products to maintain business sustainability.

Figure 3: Positioning Strategy of SWOT Diagram



Source: Authors' elaboration

Calculation of Diagonal Line Intersections

$$\frac{y-y1}{y2-y1}=\frac{x-x1}{x2-x1}$$

Diagonal AC

$$\frac{y-1.84}{-3.71-1.84}=\frac{x-(-2.91)}{2.82-(-2.91)}$$

5.73y-10.54= -5.55x-16.15

5.73y+5.55x=-5.61

Diagonal BD

$$\frac{y-1.84}{-3.71-1,84}=\frac{x-2.82}{-2.91-2.82}$$

-5.73y+10.54= -5.55x+15.65

-5.73y+5.55 x=5.11

$$5.73y+5.55x=-5.61$$
$$\underline{-5.73y+5.55\ x=5.11}$$
$$11.10x=-0.50$$
$$x= -0.045$$

$$5.73y+5.55(-0.045) =-5.61$$
$$5.73y=-5.61+0.24975$$
$$Y=-0.935$$

The intersection of the diagonal lines is on the axis (-0.045, -0.935), which is in quadrant III.

The W–T quadrant of the SWOT matrix calls for a defensive strategy to reduce internal weaknesses and mitigate external threats. For women fishers pursuing sustainable blue entrepreneurship, this involves strengthening resilience, reducing vulnerability, and protecting socio-economic capital while minimizing environmental, market, and structural risks. The conceptual foundation of this defense strategy for fisherwomen is:

1) Resilience and vulnerability concepts that emphasize the importance of the adaptive capacity of communities to cope with external shocks such as climate change, price volatility, and declining catches (Hung et al., 2024). In practice, this dimension targets external threats such as climate-related supply disruptions and market volatility through income diversification, the adoption of low-cost technologies, and the build-up of emergency financial reserves (Lanlan et al., 2023).
2) Social capital & collective action emphasizes the role of cooperatives or women's groups in transforming social capital into economic power, reducing dependence on intermediaries, and strengthening marketing networks. Social capital includes trust, norms, and networks that facilitate cooperation among community members (Halstead et al., 2022). Collective action strengthens the group's bargaining position, reducing dependence on intermediaries and expanding market access (Ahmad et al., 2024). In a defensive strategy, this social power becomes a "shield" that protects companies from external shocks through mutual support (Pham et al., 2021). This mitigates fragmented supply chains and weak bargaining power by fostering trust-based networks and collective marketing, enabling women entrepreneurs to secure fairer prices and wider market access.

3) Adaptive co-management & quadruple helix offer a collaborative management approach that involves communities, academics, government, and the private sector, enabling more integrated and sustainable interventions (Sampaolo et al., 2021; Widjajanti et al., 2020). The adaptive co-management approach combines community-based resource management with support from external actors (Galappaththi et al., 2022). In the quadruple helix, four parties work together to develop mutually reinforcing policies, technologies, and markets (Widjajanti et al., 2020). This defensive strategy leverages collaboration to build adaptive systems addressing threats and policy gaps through coordinated advocacy and evidence-based policymaking. However, challenges such as limited institutional capacity, power imbalances, and conflicts of interest must be managed to ensure inclusive and equitable outcomes.

Defensive strategies in fisherwomen's entrepreneurship are not merely about surviving threats but about building structural buffers for business sustainability amid uncertainty. Grounded in three interrelated concepts, the W–T defensive strategy highlights the need to strengthen structural resilience and develop adaptive systems for long-term sustainability, aligning with the smart governance framework that fosters multi-stakeholder coordination, evidence-based planning, and integrated environmental–economic policies to enhance coastal community resilience (Salamzadeh et al., 2024). The W–T strategy in fisherwomen's entrepreneurship seeks to minimize internal weaknesses while anticipating external threats to business sustainability, particularly those from climate change—such as disrupted seafood supplies, price fluctuations, competition from large producers, and coastal ecosystem degradation. Institutionally, it also addresses weak legal protection, limited infrastructure, and the lack of recognition of women's roles.

Strengthening the basic capacities of economic actors is the first step to reducing dependence on intermediaries and expanding markets beyond local areas. This includes diversifying raw materials, applying simple processing technologies, and obtaining product certification to access formal markets. Strategic partnerships with cooperatives, village enterprises, larger MSMEs, and the tourism sector help mitigate market risks. Digitalization and technological literacy are vital for enabling women entrepreneurs to reach wider markets, reduce dependence, and increase efficiency. Digital

empowerment also bridges gender gaps and promotes environmental sustainability. Integrating social capital, adaptive co-management, and technological innovation enhances competitiveness while supporting the SDGs (Salamzadeh et al., 2025). In the long term, the strategy aims to embed women fishers in a gender-equitable blue economy through eco-friendly innovation and active political participation. Table 7 outlines three key dimensions of these defensive strategies addressing women entrepreneurs' weaknesses and threats.

Table 7: Mapping W–T Defensive Strategies for Women Fisherfolk Entrepreneurs

Defensive Strategy Pillars	Weaknesses Addressed (W)	Threats Addressed (T)	Strategic Approach/Action
Resilience & Vulnerability Management	- W1: Limited access to financing - W2: Weak financial management - W5: Uncertified products - W13: Sub-optimal business management - W14: Decline in marine production	- T1: Climate change disrupts marine supply - T3: Fluctuating raw material prices - T9: Marine pollution & industrial waste - T11: Ecosystem deterioration - T12: Limited fishing areas	- Diversification of income sources (marine products, marine tourism) - Financial literacy & reserve fund formation - Technology adaptation (cold storage, simple processing) - Gradual certification & product quality improvement
Social Capital & Collective Action	- W6: Traditional production equipment - W7: Dependent on middlemen - W8: Inconsistent product quality - W9: The dual role of working women	- T2: Competition from manufactured products - T7: Small local market - T10: Dependence	- Strengthening cooperatives/women's groups - Collective marketing & customer networks - Internal mentoring and group-based training - Resource sharing mechanisms & social

Defensive Strategy Pillars	Weaknesses Addressed (W)	Threats Addressed (T)	Strategic Approach/Action
	- W10: No training/mentoring - W15: Low gender participation in decision-making	on middlemen	support to reduce women's double burden
Adaptive Co-management & Quadruple Helix Collaboration	- W3: Low digital literacy - W4: Minimal formal education - W11: Low gender equality awareness - W12: Lack of data/information on coastal businesses	- T5: Inadequate infrastructure - T6: Minimal legal protection - T8: Women's roles under-recognized - T14: Occupational health risks	- Collaboration with academics for digital training and market research - Advocacy for inclusive policies and micro-business protection - Provision of infrastructure (warehouses, market access) through government and CSR - Technology platform for promotion and sales

Source: Authors' elaboration

Defensive strategies for women entrepreneurs in fisheries are built on three pillars addressing internal weaknesses and external threats. Resilience & Vulnerability Management enhances adaptive capacity through better financial access, simple technologies, certification, and income diversification to reduce exposure to price, climate, and ecosystem risks. Social Capital & Collective Action leverages networks and cooperatives to cut middlemen dependence, expand markets, and provide mentoring to overcome low digital literacy and dual burdens. Adaptive Co-Management & Quadruple Helix Collaboration links communities, academia, government, and industry to deliver training, technology, legal protection, and stronger participation of women in decision-making. Together, these pillars create a complementary defence system that strengthens the resilience and sustainability of women fishers' enterprises.

Conclusion

An integrated defensive strategy for fisherwomen toward sustainable blue entrepreneurship emphasizes strengthening adaptive capacity against external pressures and internal constraints. Through resilience and vulnerability management, women fishers build capacity to withstand climate and market shocks; social capital and collective action reduce dependence on middlemen; and adaptive co-management within the quadruple helix fosters collaboration among communities, academia, government, and the private sector. This strategy goes beyond survival, creating structural buffers—institutions, human capacity, and business diversification—that enable fisherwomen to become sustainable and resilient blue entrepreneurs. However, this single-case study limits generalisability to other coastal contexts, suggesting future comparative research across regions.

Policy recommendations include: (1) microcredit programs tailored to women-led fisheries, (2) formal recognition of women's roles through local regulations, (3) capacity-building in digital literacy, certification, and cooperative management, and (4) strengthened quadruple helix cooperation for coordinated policy, market, and technology support. These measures can shift women fishers from defensive survival to proactive participation in the sustainable blue economy.

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