

# Empowering Women for Technology Entrepreneurship: Opportunities and Challenges

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**Abstract:** This paper aims to underline how the new emerging digital technologies could empower women entrepreneurship by supporting them in overcoming the constraints they face as well as in creating a more favorable network environment. We will do this by analyzing the state of the art of the research regarding entrepreneurship practices by women considering the literature that has focused on this theme up to now. *Methodology* - A structured literature review methodology is going to be applied to this paper. Through the use of specific keywords, we analyzed Scopus documents published up to now on the theme related to Women and technology entrepreneurship. Several steps have been followed to perform a systematic, transparent, and replicable study. We used the VOSviewer tool for bibliographic and cluster analysis. A final content analysis was performed to identify research areas. *Findings* - Specifically the contribution and the impact provided by the Digital Technologies is analyzed for women's entrepreneurship. A conceptual discussion on how the Digital Technologies opportunities in overcoming some of the constraints women tackle in their entrepreneurship process and which are the main research streams that emerge for future investigation on the theme, is provided. *Practical implications* – The major implication is to advance knowledge and practice in the area of gender in management and use of Digital Technologies by focusing upon empirical research, theoretical developments, practice and current issues. Benefits are related to a better understanding of the debate on “Gender and Management” themes by reconsidering networking activities with social media.

**Keywords:** Entrepreneurship; Innovation; Gender Issues; Digital; Technology

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## 1. Introduction

Digitization has spurred a wave of innovation and entrepreneurial activities, transcending traditional industry boundaries. Scholars, such as Yoo et al., 2012; Nambisan et al., 2017; Cohen et al., 2017; Giones and Brem, 2017; von Briel et al., 2017 have extensively studied the multifaceted effects of digitization on various aspects of entrepreneurship. These impacts extend to how new ventures are conceptualized, developed, and scaled in the digital era.

Despite the transformative potential of digital technologies, women face unique challenges in the entrepreneurial landscape. The existing literature on women in technology entrepreneurship, highlighting the disparities, barriers, and opportunities that women encounter as they navigate the digital frontier. Case studies and examples from Chandra and Leenders, 2012; Huang et al., 2017; Rayna et al., 2015; Chang, 2017) illustrate how women entrepreneurs are using digital tools to overcome challenges, build networks, and contribute to the swift evolution of novel ventures. It also considers the role of networks, ecosystems, and communities in shaping women's experiences in technology entrepreneurship.

While there has been a growing interest in exploring the intersection of women entrepreneurship and digital technologies, a significant research gap exists in comprehensively understanding how the latest emerging digital technologies can serve as empowering tools for women entrepreneurs. The current literature has indeed delved into entrepreneurship practices by women, but a systematic analysis of the potential impact of new digital technologies on overcoming constraints faced by women entrepreneurs and fostering a supportive network environment is notably lacking.

The existing research primarily focuses on traditional aspects of women entrepreneurship, often overlooking the transformative potential that emerging digital technologies can bring to the landscape. As women continue to encounter unique challenges in entrepreneurship, such as access to resources, networks, and opportunities, there is a critical need to explore how digital technologies can act as catalysts for empowerment.

This paper contributes to addressing this research gap by conducting a thorough review of the current state of the literature, specifically emphasizing the intersection of women entrepreneurship and emerging digital technologies. By synthesizing existing research, the paper aims to shed light on the untapped potential of digital

tools in mitigating challenges faced by women entrepreneurs and creating an environment conducive to their success.

In doing so, the paper not only provides a comprehensive overview of the existing literature on women entrepreneurship but also goes beyond by offering insights into the role of digital technologies in shaping and transforming the entrepreneurial landscape for women. The contribution lies in bridging the gap between current knowledge and the unexplored opportunities that digital advancements present for women entrepreneurs, thereby paving the way for future research and practical applications in the field.

## 2. Methodology

To define the state of the art in literature on the potential empowerment of women entrepreneurship through emerging digital technologies, we conducted a systematic literature review (SLR). This approach, recognized for its rigor and ability to uncover trends and future research directions, serves as an empirical foundation to minimize biases and ensure comprehensive coverage of seminal articles (Centobelli et al, 2017, Massaro et al., 2016; Petticrew and Roberts, 2006; Tranfield et al., 2003)). A SLR is particularly appropriate to analyze phenomena the relationship between the process of digital technologies and the theoretical framework of women entrepreneurship. Moreover, it enables defining a future research agenda, as well as implications both for theory and practice (Kraus et al., 2022).

This paper goes beyond the conventional SLR by incorporating keyword and content analysis, adding a more detailed content-driven examination to extract meaningful insights (Ribière and Walter, 2013). Recent advancements in SLRs involve leveraging the wealth of academic articles to deduce prior contributions (Massaro et al., 2016).

To initiate the SLR process, we formulated research questions focusing on the literature's development, its focal points, and potential implications (Massaro et al., 2016). The identified research questions were as follows:

*RQ1. How is the literature on women's entrepreneurship and digital technology evolving? RQ2. What is the specific focus of the literature? RQ3. What are the implications of this research?*

Following the establishment of research questions, a research protocol was developed, specifying information sources, methods, studies to be analyzed, and tools for analysis and synthesis (Petticrew and Roberts, 2008). This study combined both SLR and bibliometric analysis to enhance the accuracy of interpreting findings, aligning with recommendations advocating for the complementary use of these two methods. Numerous scholars, including Feng et al. (2017) and Fahimnia et al. (2015), suggested combining these two approaches to augment the significance of the outcomes.

The initial set of articles was retrieved from the Scopus database due to its extensive coverage of academic journals (Mishra et al., 2017). This aligns with the consensus that Scopus provides a comprehensive data repository for literature review studies.

The keywords and combinations identified and used for the article search were: entrepreneur\* AND gender AND issue AND innovation OR digital OR technolog\*in the title, abstract, author keywords, The search yielded a total of 158 articles, and data collection took place in September 2023–October 2023.

Data were processed by following different descriptive analysis. Finally, a content analysis was conducted to comprehend the emerging trends, research gaps as well and future directions.

## 3. Research Findings

Articles' evolution in time. The trend of the research papers developed over the years is depicted in Figure 1. the graph demonstrates that recently there is a growing interest by scholars and researchers in the investigation of research topics at the intersection of the debates on women and technology entrepreneurship. The peak year for relevant publications in these journals was 2022.

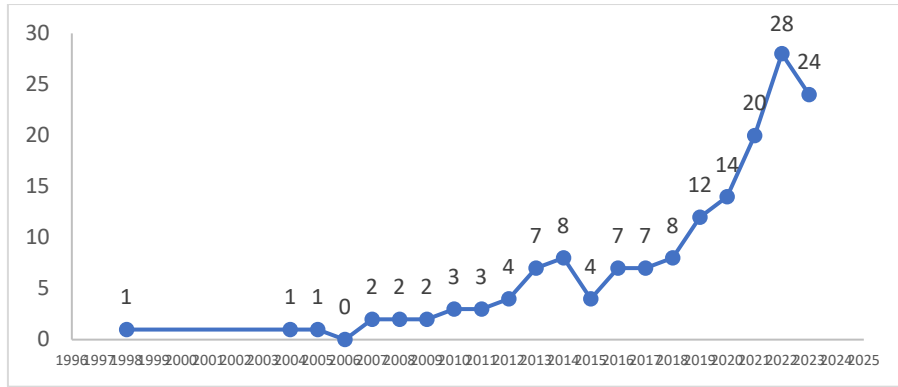


Figure 1: Articles evolution in time

Geography of the article- for what concern the geography as it could be evinced by figure 2. The countries with the highest number of articles are the USA and UK and Spain, with 29, 23 and 14 articles, respectively.

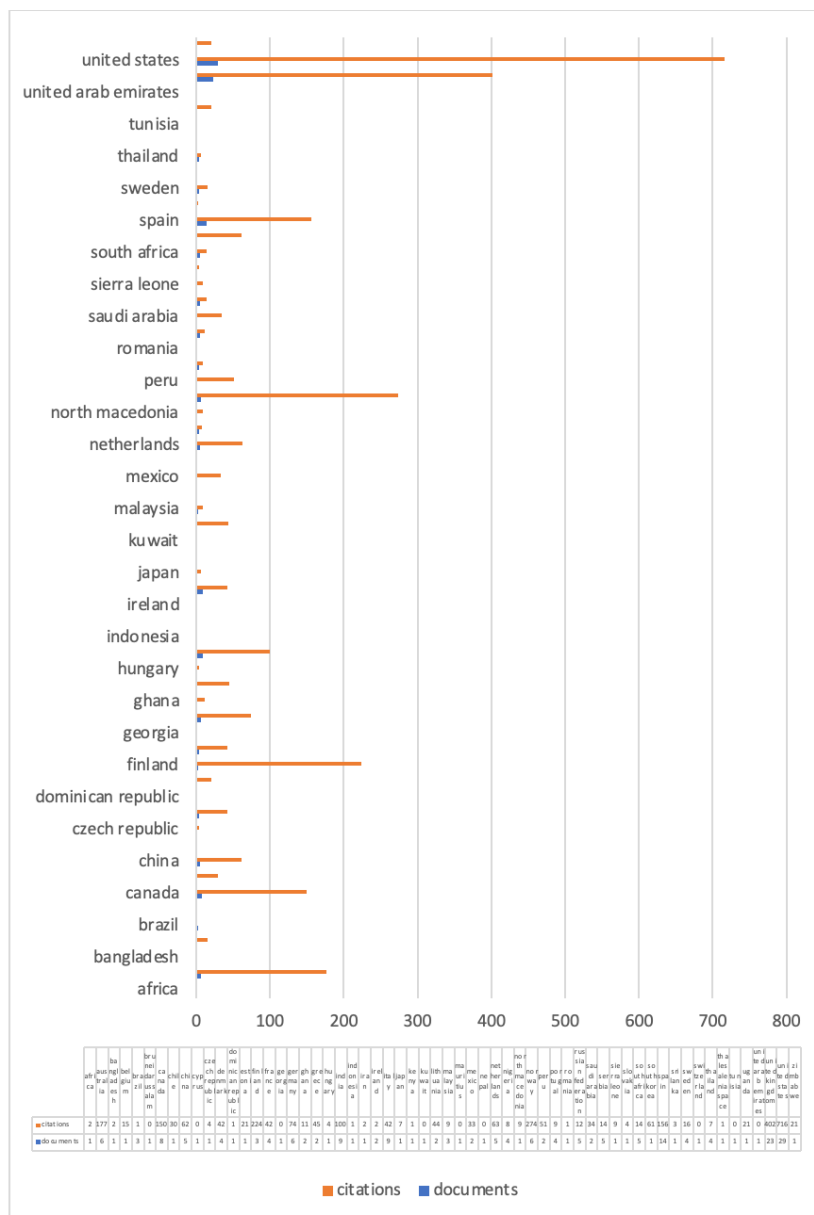


Figure 2: Geography of papers and citations

Considering the different countries' citation trend (Figure 3), it could be easily noticed that the contributions offered USA register the highest citation level. While there is one article from United Arab Emirates that is ranked second for citations.

Top ten countries per documents					Top ten countries per citations				
Selected	Country	Documents	Citations	Total link strength	Selected	Country	Documents	Citations	Total link strength
<input checked="" type="checkbox"/>	united states	29	716	8	<input checked="" type="checkbox"/>	united states	29	716	9
<input checked="" type="checkbox"/>	germany	6	74	6	<input checked="" type="checkbox"/>	canada	8	150	6
<input checked="" type="checkbox"/>	canada	8	150	5	<input checked="" type="checkbox"/>	norway	6	274	6
<input checked="" type="checkbox"/>	spain	14	156	5	<input checked="" type="checkbox"/>	united kingdom	23	402	6
<input checked="" type="checkbox"/>	united kingdom	23	402	5	<input checked="" type="checkbox"/>	germany	6	74	5
<input checked="" type="checkbox"/>	india	9	100	3	<input checked="" type="checkbox"/>	netherlands	5	63	5
<input checked="" type="checkbox"/>	norway	6	274	3	<input checked="" type="checkbox"/>	spain	14	156	5
<input checked="" type="checkbox"/>	italy	9	42	1	<input checked="" type="checkbox"/>	finland	3	224	3
<input checked="" type="checkbox"/>	australia	6	177	0	<input checked="" type="checkbox"/>	india	9	100	3
					<input checked="" type="checkbox"/>	australia	6	177	0

Figure 3: Top 10 countries in terms of citations and documents

The analysis of the distribution of publications by scientific journal (Dumay and Cai; 2014) is represented in figure 4.

Selected	Source	Documents	Citations	Total link strength
<input checked="" type="checkbox"/>	engineering economics	3	65	0
<input checked="" type="checkbox"/>	entrepreneurship and regional develo...	2	243	0
<input checked="" type="checkbox"/>	equality, diversity and inclusion	2	90	0
<input checked="" type="checkbox"/>	gender, place and culture	2	70	0
<input checked="" type="checkbox"/>	iimb management review	2	21	0
<input checked="" type="checkbox"/>	international journal of entrepreneuri...	4	114	0
<input checked="" type="checkbox"/>	international journal of entrepreneurs...	3	98	0
<input checked="" type="checkbox"/>	international journal of gender and e...	6	337	0
<input checked="" type="checkbox"/>	journal of business venturing insights	2	0	0
<input checked="" type="checkbox"/>	journal of enterprising communities	2	22	0
<input checked="" type="checkbox"/>	journal women's entrepreneurship an...	2	4	0
<input checked="" type="checkbox"/>	proceedings of the acm on human-c...	2	12	0
<input checked="" type="checkbox"/>	sidrea series in accounting and busin...	3	0	0
<input checked="" type="checkbox"/>	springer proceedings in business and...	3	8	0
<input checked="" type="checkbox"/>	sustainability (switzerland)	3	8	0

Figure 4: Scientific journal distribution

Findings revealed a high fragmentation in the distribution: the analyzed articles analyzed were published in more than 100 scientific journals. As illustrated in figure 4, which lists the most journals, the majority of the papers were published in "International Journal of Gender and Entrepreneurship (six publications) and International Journal of entrepreneurship (four publications), with the remaining journals having from one to two publications.

The analysis also focused on finding out the most cited paper and the citations of papers per year and per author. Table 2 shows the citations received per paper and per year. The most cited paper resulted to be the paper Agnete et al (2013) that provides a state of the art situation of the research related to innovation and gender issues, it is followed by the paper of Amine and Staub (2009) and the paper of Braun (2010)

Obviously, the papers published recently have fewer citations and thus are useful to analyze the most influential papers (authors) in terms of citations. Therefore, most cited paper per year (CPY) is analyzed where the paper of Agnete et al (2013) is confirmed at first place, while the second most cited paper /year is the article of Dai et al., (2019).

Table 3: Top five papers in terms of citations

Authors	Title	Year	Source title	Cited by	CPY	Ranking CPY
<b>Agnete Alsos G.; Ljunggren E.; Hytti U.</b>	Gender and innovation: State of the art and a research agenda	2013	<i>International Journal of Gender and Entrepreneurship</i>	182	16,6	1
<b>Amine L.S.; Staub K.M.</b>	Women entrepreneurs in sub-Saharan Africa: An institutional theory analysis from a social marketing point of view	2009	<i>Entrepreneurship and Regional Development</i>	180	12	3

Authors	Title	Year	Source title	Cited by	CPY	Ranking CPY
Braun P.	Going green: women entrepreneurs and the environment	2010	<i>International Journal of Gender and Entrepreneurship</i>	94	6,7	6
Ranga M.; Etzkowitz H.	Athena in the world of techne: The gender dimension of technology, innovation and entrepreneurship	2010	<i>Journal of Technology Management and Innovation</i>	84	6	9
Martin L.M.; Wright L.T.	No gender in cyberspace?: Empowering entrepreneurship and innovation in female-run ICT small firms	2005	<i>International Journal of Entrepreneurial Behaviour and Research</i>	69	3,6	10

### 3.1 Cluster and Content Analysis

The phase of content analysis commenced with coupling analysis (Kessler, 1963) performed through VosViewer software which measured the connectivity of each research paper of the sample on the basis of the references that they share (Boyack & Klavans, 2010). The strength of relatedness increases when a document receives more citations.(Kessler, 1963), employing the 158 papers within the data sample. As outlined in the methodology section, the units of analysis were documents and sources, and relevance was assessed by considering articles that predominantly shared at minimum 2 references (Boyack and Klavans, 2010). The outcome of this analysis resulted in 8 clusters and 37 papers, grouped with different colors in the map created by the tool (table 4).

The utilization of clustering was intended to avoid the fragmentation of results and the scattering of related topics across various domains. These clusters were established to amalgamate articles that represented a distinct topic or approach. To facilitate the content analysis of the selected papers, we employed the clustering algorithm developed by Van Eck and Waltman (2017)

By analysing in depth each paper included in the clusters the following research areas are identified.

#### 3.1.1 Research Area 1: "Empowering Women and Technology"

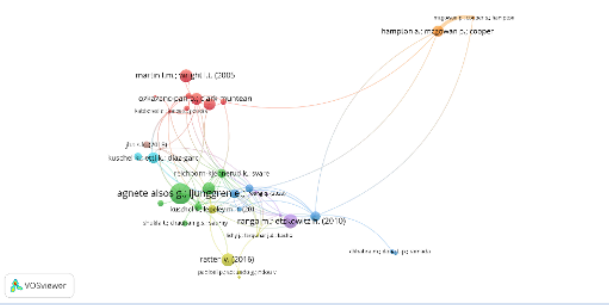
The studies classified in this cluster considered the role of Communication technologies and Digital Literacy on Women empowering and entrepreneurship. Among the studies presenting a specific case study or highlighting the role women empowerment through technological advances are the following: Ekinsmyth C. (2014), Kubberød et al. (2021), Alda-Vidal et al. (2017), Ozkazanc-Pan B. et al. (2018) all use qualitative methodology to conduct their research on women empowerment through technological advances. Ekinsmyth C. (2014) states that women experience structural disadvantages from the outset, hindering them in resourcing their enterprises and establishing strategic alliances. However, it seems that they have learnt to cope with and mitigate these disadvantages through learning to not belong and in doing so, challenge and subvert the masculinized culture. Not belonging brings empowerment to the entrepreneurial learning process, contributing to the theory of belonging. Furthermore, Kubberød et al. (2021) propose the notion of by-passing as a different variant of coping with peripheral status, which seeks to make gender irrelevant. The research draws upon empirical evidence from the entrepreneurial learning of nine women opportunity entrepreneurs in the high-technology sector in Norway. It employs a qualitative phenomenological approach, with retrospective and in-depth interviews to capture and analyze the entrepreneurs' lived experiences and learning histories. Gupta and Etzkowitz (2021) grounded in a post-structural feminist perspective, exploring the interconnection of women entrepreneurs with their socio-cultural and institutional context. The findings highlight the significant influence of context in shaping opportunities and addressing gender-related challenges in entrepreneurship. Positive outcomes are observed in experiences with academic incubators, contributing to improved gender dynamics and the cultivation of an emerging entrepreneurial culture.

#### 3.1.2 Research Area 2: "Growth and Development of Female Entrepreneurs"

Different studies have concluded that entrepreneurship has documented differences in male and female entrepreneurs' growth ambitions including Reichborn-Kjennerud and Svare (2014), Gunawan et al. (2021), and Dai et al. (2019). The sample included both genders from middle social class. Further delving into entrepreneurship reveals gender-based drivers, exposing variations in motivations and practices between female and male entrepreneurs. The materials also pioneer an exploration of gender diversity within new venture teams, establishing a positive correlation between increased gender diversity and heightened innovation performance, underscoring the growing influence of women in shaping entrepreneurial skills. The studies conclude that the

findings substantiated that women and men have similar qualities as entrepreneurs, but women's ambitions and values tend to be different to those espoused by men. This influences their growth strategies. Additionally, Cesaroni and Sentuti (2015) conduct a study on bank loans and the differences in gender. They consider three hypotheses. First, if men and women entrepreneurs ask for new bank loans during the crisis. Second, if they obtain required bank loans at the same conditions and lastly, if there are other variables, other than gender, that influence access to bank credit. The analysis of Italian men and women entrepreneurs facing an

**Table 4: Cluster analysis table**

Bibliographic map			
			
Cluster	Authors	Year	Citations
Cluster 1 (9 items - red)	Alda-Vidal C.; Rusca M.; Zwarteven M.; Schwartz K.; Pouw N.	2017	12
	Ekinsmyth C.	2014	58
	Gupta N.; Etkowitz H.	2021	13
	Kubberød E.; Jones S.; Pettersen I.B.	2021	5
	Kumari M.	2020	7
	Martin L.M.; Wright L.T.	2005	69
	May D.; Hosch-Dayican B.; Leisyte L.; Lensing K.; Sigl L.; Terkowsky C.	2015	3
	Ozkazanc-Pan B.; Clark Muntean S.	2018	59
Cluster 2 (7 items - green)	Pablo-Martí F.; García-Tabuenca A.; Crespo-Espert J.L.	2014	15
	Agnete Alsos G.; Ljunggren E.; Hytti U.	2013	182
	Cesaroni F.M.; Sentuti A.; Buratti A.	2015	25
	Dai Y.; Byun G.; Ding F.	2019	61
	Gunawan A.A.; van Riel A.A.C.R.; Essers C.	2021	15
	Reichborn-Kjennerud K.; Svare H.	2014	32
	Shukla T.; Chauhan G.S.; Saumya S.	2018	13
Cluster 3 (6 items – light blue)	Striebing C.; Kalpazidou Schmidt E.; Palmén R.	2019	3
	Alonso-Galicia P.E.; Fernández-Pérez V.; Rodríguez-Ariza L.; Fuentes-Fuentes M.D.M.	2015	33
	Chhabra M.; Dana L.-P.; Ramadani V.; Agarwal M.	2022	9
	Gilmartin S.K.; Thompson M.E.; Morton E.; Jin Q.; Chen H.L.; Colby A.; Sheppard S.D.	2019	25
	Iman, A. Nazarov, Z. Obydenkova, A	2022	10
	Martin L.; Wright L.; Beaven Z.; Matlay H.	2015	39
Cluster 4 (5 items – light green)	Uribe-Toril J.; De Pablo J.; Ruiz-Real J.L.; Pires Manso J.R.	2019	8
	Fraser S.	2019	4
	Kuschel K.; Lepeley M.-T.	2016	30
	Lichy J.; Farquhar J.D.; Kachour M.	2020	3
	Paoloni P.; Secundo G.; Ndou V.; Modaffari G.	2019	7
Cluster 5 (4 items – violet)	Ratten V.	2016	68
	De Rosa M.; Bartoli L.; Charatsari C.; Lioutas E.	2021	5
	Lawton Smith H.; Meschitti V.; Le Roux J.; Panton M.; Baines N.; Poulouvassilis A.; Henry C.	2020	
	Ranga M.; Etkowitz H.	2010	84
Cluster 6 (2 items – turquoise)	Wang Q.	2023	2
	Cadenas G.A.; Cantú E.A.; Lynn N.; Spence T.; Ruth A.	2020	25
Cluster 7 (2 items – orange)	Kuschel K.; Ettl K.; Díaz-García C.; Alsos G.A.	2020	51
	Hampton A.; McGowan P.; Cooper S.	2011	49
Cluster 8 (2 items – acid green)	McGowan P.; Cooper S.; Hampton A.	2013	3
	Alsos G.A.; Haugum M.; Ljunggren E.	2017	2
	Jha S.K.	2018	21

economic recession indicates limited gender-based differences in accessing credit during the crisis. While some small differences persist, particularly in women encountering greater challenges in securing requested funding, other variables such as age, education, banking history, and industry involvement show minimal impact on credit access. The study suggests that, overall, these factors do not significantly influence entrepreneurs' access to credit during economic downturns.

### 3.1.3 *Research area 3: "Female Entrepreneurs and Leadership"*

In this cluster, there are some relevant studies focusing on the images of entrepreneurs that tend to reflect male stereotypes, together with the nature of socialisation processes that can generate barriers to female entrepreneurship, creating a "glass ceiling" effect. Martin et al. (2015) collect data on 15 female entrepreneurs with businesses that had progressed beyond the initial start-up phase were selected from national databases. They find that the ability of women to withstand challenges may stem from their readiness to embrace established male models of conducting business and a determination to demonstrate their capabilities by adhering to these standards. Unlike male practitioners, who were often readily acknowledged as skilled entrepreneurs, women encountered additional obstacles in gaining acceptance and credibility due to their perceived "unusual" status. This is also supported by Alonso-Galicia et al. (2014) who show that the influence of close social groups is perceived differently by men and women, particularly as regards the support received for academics' attitudes and perceptions of control over the development of entrepreneurial intention. Lastly, Iman et al. (2022) explore gender dynamics in entrepreneurship within post-Communist societies, utilizing data from 11,617 private firms across 25 Eastern Europe and Central Asian states. The findings reveal that female owners exhibit a heightened inclination for introducing new marketing strategies compared to males. Additionally, the presence of top female managers positively correlates with firm innovation, particularly in the context of increased democratization, which acts as a transformative force in reducing gender disparities across diverse innovative practices.

### 3.1.4 *Research Area 4: "Women Entrepreneurs in Digital Start-ups"*

As in our study, Kuschel and Lepeley (2016) and Paoloni et al. (2018) use a systemic literature review to highlight the potential of emerging digital technologies. This emerging digital era emphasizes their significant role in enhancing opportunities for women in entrepreneurship. These technologies serve as valuable tools in overcoming constraints faced by women entrepreneurs and contribute to the creation of a more conducive network environment. Furthermore Ratten (2016) tries to understand the role of female entrepreneurs who are intending to start an informal business by focusing on the role of knowledge and innovation. Female entrepreneurship and the role of customer knowledge development, innovation outcome expectations and culture on intentions to start informal business ventures. Lastly, Lichy et al. (2020) investigates how women entrepreneurs use social networking sites (SNS) in marketing their businesses in Lebanon. The authors use a two-phase research design of, first, a panel of specialised business commentators and, second, digital qualitative data collection that enabled access to hard to reach informants. The study shows that women entrepreneurs leverage Social Networking Sites (SNS) to optimize networking for prospecting, communicating, and building relationships with stakeholders. Additionally, SNS plays a role in supporting family units by providing an extra income source and facilitating connections.

### 3.1.5 *Research Area 5: "Gender Dimension of Technology, Innovation, and Entrepreneurship"*

The study of De Rosa et al. (2021) delves into innovation adoption among Italian female-owned farms, exploring how support services and farmers' entrepreneurial mindset shape these patterns. It emphasizes the necessity for gender-specific policies in rural Italy to address diverse innovation approaches, recognizing the crucial role of understanding gender dynamics within technology, innovation, and entrepreneurship. In the same direction, Ranga and Etkowitz (2010) spotlight the growing acknowledgment of women's contributions in innovation, technology, and entrepreneurship, previously confined to feminist studies. Their study explores persistent challenges hindering women's presence in scientific and entrepreneurial roles, highlighting their often-overlooked impact in technological advancements and showcasing a significant instance of women leading a major technological innovation during the shift to a Knowledge Society. This evidence is in line with the research of Wang (2023) that concluded that the gendered resilience of these businesses within the realm of technology, innovation, and entrepreneurship amid the pandemic's challenges. Finally, the research piece of Lawton et al. (2020), highlights the gender disparity in academic entrepreneurship, focusing on STEM fields' underrepresentation of women and their challenges in commercialization. It sheds light on commercial activities

at Birkbeck, University of London, revealing men's dominance in leading research grants and factors like networks and organizational support influencing commercial success, offering key insights for universities and investors.

### 3.1.6 *Research Area 6: "Entrepreneurship Gender Gap and Education"*

In this cluster aggregates articles that point out the need for further research to address gender gap and pave the way toward gender equality in STEM-driven entrepreneurial ventures. Likewise, Cadenas et al. (2020) in their study underscore the gender disparities in STEM-related entrepreneurship, pointing out the underrepresentation of women in this domain due to systemic biases and social structures. It advocates for bridging this gap by merging insights from women's entrepreneurship and gender dynamics within STEM, emphasizing factors affecting women's participation in STEM-based entrepreneurship. Furthermore Kuschel et al. (2020) discuss the challenges faced by underrepresented students in accessing entrepreneurial education within STEM fields and the implementation of a social entrepreneurship program named "Poder" to address this. It showcases the program's success in significantly enhancing various skills and attitudes among diverse students, highlighting its effectiveness in promoting career development and addressing educational gaps and systemic issues within entrepreneurship and STEM education.

### 3.1.7 *Research Area 7: "Networking and Female High-Tech Entrepreneurship"*

This cluster includes papers that investigate the networking and women involved in high-tech entrepreneurship. Hampton et al. (2011) addresses the lack of research on female entrepreneurial networks within male-dominated high-tech sectors. Through qualitative interviews with female entrepreneurs in Science, Engineering, and Technology (SET) fields in Northern Ireland, the study explores the nature, composition, and evolution of these networks over the business lifecycle. It highlights the importance of understanding network quality for female entrepreneurs in SET-based ventures, offering insights crucial for government interventions aimed at enhancing networking effectiveness and supporting women in high-tech entrepreneurship, an area relatively unexplored in existing research on female entrepreneurship. Moreover, McGowan et al. (2013) highlights the significance of networking in high-tech entrepreneurship, especially for women who are underrepresented in technology-based sectors. It notes the lack of comparative research on how male and female entrepreneurs develop and utilize networks, emphasizing the importance of understanding these dynamics for enhancing female engagement in high-tech entrepreneurship. This study employs qualitative methods to explore the nature and quality of entrepreneurial networks among both genders, aiming to uncover patterns and implications that could aid in improving female participation and success in high-tech ventures.

### 3.1.8 *Research Area 8: "Gender Equality in Entrepreneurship Ecosystem"*

The studies classified in this cluster considered gender equity in the entrepreneurship ecosystem. Particularly, the first study of Alsos et al. (2017) explores the implementation and impact of a policy initiative, Norway's Program for regional R&D and innovation, aimed at fostering gender balance in regional entrepreneurial ecosystems. The research assesses the relationship between planned gender initiatives and the actual development, finding limited progress in achieving gender balance despite ambitious goals and initiatives. The study highlights a lack of effective tools and limited coherence between policy goals, implemented activities, and reporting requirements. It suggests that while the ecosystem approach addresses industry and firm levels effectively, it lacks measures to involve women effectively. The conclusion emphasizes the complexity of fostering an economic ecosystem suitable for women solely through policy efforts, advocating for a more comprehensive approach addressing gender balance and offering practical tools to achieve these goals. Meanwhile, in the research conducted by Jha (2018), it is emphasized that to fulfill the potential of numerous opportunities, substantial funding, and skilled workforce, the ecosystem must prioritize value creation overvaluation, provide education for young entrepreneurs, encourage a culture accepting of purposeful failures, address India's distinct challenges, and ensure inclusivity within the startup landscape, particularly focusing on gender equality in entrepreneurship.

## 4. **Conclusions and Implications**

In conclusion, the research clusters present a comprehensive exploration of various dimensions surrounding women in entrepreneurship, with a specific focus on technology, growth strategies, leadership, digital start-ups, the gender dimension of technology, networking, and the broader entrepreneurship ecosystem. The findings shed light on multifaceted challenges and opportunities that women encounter in their entrepreneurial journeys.

*Empowering Women and Technology:* The intersection of communication technologies and digital literacy in empowering women entrepreneurs is a critical area of study. This intricate interplay forms the foundation for redefining not only how women engage with technology but also how technology can catalyze their entrepreneurial success. As digital literacy becomes increasingly integral to entrepreneurial ventures, understanding how women harness these technologies becomes paramount. Exploring the specific platforms, applications, and strategies that resonate with women in business provides nuanced insights into their preferences and challenges in navigating the digital realm.

*Coping Mechanisms - The Strategy of "Not Belonging":* Delving into the coping mechanisms adopted by women entrepreneurs, particularly the strategy of "not belonging," unveils a profound aspect of their resilience. This strategic approach suggests that women entrepreneurs navigate structural disadvantages by forging their own paths and challenging traditional norms. Further research can dissect the nuances of this strategy, exploring how it evolves over time and its impact on entrepreneurial decision-making.

*Contextual Influences and Tailored Support Structures:* The acknowledgment of contextual influences on women entrepreneurs underscores the need for customized support structures. An in-depth examination of various contexts — be it socio-cultural, economic, or institutional — provides a roadmap for tailoring support mechanisms. Understanding how different contexts shape the entrepreneurial journey can inform the development of targeted interventions and policies that resonate with the diverse needs of women entrepreneurs.

*Positive Outcomes and Academic Incubators:* The positive outcomes observed in experiences with academic incubators offer a glimpse into the transformative potential of structured support systems. Investigating the specific elements within academic incubators that contribute to women's success unveils best practices and models for replication. Academic institutions, policymakers, and industry stakeholders can draw inspiration from these success stories to foster an environment where women entrepreneurs thrive.

*Female Entrepreneurs and Leadership:* Overcoming deeply ingrained stereotypes requires a concerted effort to challenge traditional perceptions. The influence of social groups on women's entrepreneurial journeys emphasizes the critical role of support networks and mentorship programs. Efforts to redefine accepted norms and celebrate the unique contributions of female entrepreneurs are vital for dismantling barriers to leadership.

*Women Entrepreneurs in Digital Start-ups:* The transformative role of emerging digital technologies in dismantling constraints faced by women entrepreneurs is evident. Leveraging social networking sites not only optimizes business interactions but also underscores the pressing significance of digital skills in navigating the complexities of the contemporary entrepreneurial landscape.

*Entrepreneurship Gender Gap and Education:* Bridging the gender gap in STEM-driven entrepreneurial ventures necessitates a comprehensive approach. Addressing systemic biases and implementing impactful social entrepreneurship programs is crucial for empowering diverse students and reshaping attitudes within STEM education.

As implications we highlight the need for ongoing research in women's entrepreneurship, emphasizing:

1. **Longitudinal Studies:** Explore the dynamic evolution of women entrepreneurs over time, revealing the impact of external factors on their trajectories.
2. **Technological Adoption:** Investigate how rapid technological changes influence women entrepreneurs, shaping their business landscape and providing new growth avenues.
3. **Policy Evaluation:** Assess the effectiveness of existing policies supporting women in entrepreneurship, offering insights for refining strategies and interventions.
4. **Institutional Support:** Examine the role of institutions in supporting women entrepreneurs, with findings informing the creation of more conducive environments.

Addressing these areas can enhance our understanding of challenges and opportunities, contributing to policies fostering gender equality. Ongoing collaboration among academia, policymakers, and industry is crucial for creating an environment where women thrive as entrepreneurs.

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