

From Literacy to Legacy: A Systematic Review on Digital Entrepreneurship and Sustainable Growth among Women-Led MSMEs

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Abstract

The aim of this research is to conduct a systematic critique and analysis of the existing body of literature on digital entrepreneurship and sustainable development in MSMEs operated and managed by women, with a focus on digital literacy and utilization. To achieve this aim, the study employs a Systematic Literature Review (SLR) approach in accordance with the PRISMA guidelines. Based on the Scopus database search, twenty research articles were selected following a rigorous screening process. The findings are categorized into four major themes: digital literacy and readiness, access to technology, the role of digital entrepreneurship in business expansion, and community and ecosystem support. The analysis yields key insights indicating that women operating MSMEs face significant challenges in digital adoption, including low levels of digital literacy, limited access to technology, and a lack of specialized training. However, digital technologies offer substantial potential to improve efficiency and marketing performance of women-led MSMEs when supported by appropriate structures. This study contributes to academic literature by providing a comprehensive understanding of women's digital entrepreneurship and technological adaptation. In addition, it highlights critical gaps in the existing literature, particularly in the context of developing countries.

Keywords: Digital Entrepreneurship, Digital Literacy, Microenterprises, Sustainable Growth, Women Entrepreneurs

Introduction

The digital economy has developed rapidly, and the global business landscape has changed significantly. Digital entrepreneurship has emerged as an important driver of economic growth, especially for Micro, Small, and Medium Enterprises (MSMEs). This provides a huge opportunity for women entrepreneurs to access the global market, increase the efficiency of business operations, and boost economic empowerment by utilizing digital technologies such as e-commerce, social media platforms and digital financial services (Muafi et al., 2021; Tanaji et al., 2025; Affandi et al., 2024). Women-led Micro, Small and Medium

Enterprises (MSMEs) play an important role in economic development, yet their participation in the digital transformation is uneven and limited. Despite the increasing number of digital opportunities, women still face barriers to fully exploiting the benefits of digital entrepreneurship due to cultural factors, support systems, and social environments that influence their involvement in entrepreneurship (Henry & Lewis, 2023).

Previous studies have shown that the level of digital literacy of women-owned MSMEs is still relatively low, and the MSMEs are severely constrained in the optimal use of technological resources in their business operations (Faudzi et al., 2024; Helmi et al., 2025; Salim et al., 2025). The main factors include low access to digital literacy training, negative views of technology, and continuation of traditional business practices (Molina-López et al., 2021). Additionally, limited access to infrastructure such as unreliable internet connectivity and lack of user-friendly digital platforms further limits women entrepreneurs' ability to successfully engage in digital entrepreneurship and achieve sustainable development outcomes (Luthfia et al., 2025; Kang, 2022). This digital divide causes women to lag behind in entrepreneurship participation and affects the achievement of the Sustainable Development Goals (SDGs) (Akhter et al., 2023).

Although various initiatives have been implemented by governments and development organizations to promote technology adoption, most previous studies have only examined digital factors in isolation. Therefore, there is still a lack of studies that combine aspects of digital literacy, access to technology and their impact on overall business performance, especially among women-led SMEs.

In addressing this gap, the present study adopts a systematic literature review approach to synthesise existing research on digital entrepreneurship among women-led MSMEs. This study aims to: (a) identify factors influencing digital literacy and readiness; (b) examine challenges in accessing digital technologies; (c) analyze the impact of digital adoption on business performance and growth; and (d) synthesize existing research gaps to propose future research directions.

The current study holds significance in various domains. It combines different research on digital entrepreneurship and digital readiness and access barriers into a clear analytical framework. From a policy standpoint, it provides guidance for formulating inclusive and gender-sensitive digital empowerment strategies. The findings provide practical directions for technology providers, non-governmental organisations (NGOs) and training institutions to improve digital adoption of women entrepreneurs. The findings of this study are particularly relevant for policymakers, development agencies, digital platform providers and women entrepreneurs seeking to enhance business performance through digital transformation.

Literature Review

The research undertaken in this paper is based on the systematic literature review approach. In total, 20 articles are used in this research. The articles are based on various aspects related to digital entrepreneurship by women in MSMEs from 2021 to 2025. Four major takeaways from this research are in Themes and Corresponding Studies. The overall research is covered under four major themes: (i) Digital Readiness & Literacy, (ii) Access to

Technology & Infrastructure Barriers, (iii) Business Performance & Growth, and (iv) Community Empowerment & Support. This provides a complete perspective of both internal and external determinants of failure or success in the digital entrepreneurial ecosystem in terms of women's empowerment.

Digital Readiness and Literacy

Digital literacy refers to the ability of the women participating in entrepreneurship to understand and make use of technology in day-to-day business operations. Various studies identify digital literacy in the early stages of involvement in the digital economy (Helmi et al., 2025c; Muafi et al., 2021). According to Faudzi et al. (2024), effective human capital with primary ICT awareness has been considered essential in terms of digital readiness.

Based in the Malaysian and South Asia cultures, Akhter et al. (2023) argued that a lack of exposure to technology in educational phases would create distrust in digital platforms among women. Moreover, mentoring support and formal training are assumed by Sitaridis and Kitsios (2023) to be significant in improving the readiness levels of women in digital business endeavors.

According to Hazudin et al. (2022), digital readiness not only incorporates technical skills but also other aspects of attitude towards the use of technology that are influenced by cultural and social factors. This view connects with Aracil-Jordá et al. (2023) in that they support the use of the local ecosystem perspective in improving the usability of digital technologies in the rural women's social networks.

Access to Technology and Infrastructure Barriers

Among the factors that have constantly thwarted the progress of digital entrepreneurship among women is the lack of access to digital infrastructure and technologies. According to research conducted by Faudzi et al. (2024) and Pal and Bhowmick (2024), instability in internet access, the cost of technological devices, and the absence of inclusive platforms are some factors that hamper the engagement of women in the digital economy.

Evidence from research conducted by Alom et al. (2025) in Bangladesh indicates that although there has been progress in the use of digital financial services, the number of women utilizing digital financial services is relatively low owing to logistical challenges and system reliability. Further evidence from research carried out by De Oliveira Malaquias and Malaquias (2022) indicates that MSMEs owned by women often face technical challenges in accessing e-commerce platforms and digital payment systems that are not women friendly.

Further, the observations made by Mousa et al. (2024) and Ong et al. (2021) make apparent that challenges in infrastructure do not only lie in the constraints imposed by infrastructure but also in social perceptions in terms of social fears versus the use of technology by women in conservative society.

Business Performance and Growth

The third theme focuses on the role of digital entrepreneurship in business and sustainable growth among women business owners. According to Alom et al. (2025), the use

of digital financial services such as e-wallets and microloans has a direct positive impact on working capital and the scalability of business owned by rural women.

The social performance enhancement of women business owners has been further linked by Aracil-Jordá et al. (2023) to the innovation ability of those women through digital platforms in terms of applications in promotion and engagement. The study Helmi et al. (2025) underscored that entrepreneurial training targeting technological focus has led to the motivation of women in extending the reach of their business.

For instance, the strategic use of digital resources greatly impacted the overall result recorded in the research conducted by Luthfia et al. (2025), while the amalgamation of business and technology is essential in improving the financial outcomes of MSMEs owned by women, supported by the views presented by Nayak et al. (2025).

Empowerment and Community Support

Finally, the fourth theme focuses on the aspects of social and community empowerment that support women in their digital entrepreneurial journey. Mousa et al. (2024) through their study in Egypt emphasized that digitalization has opened up space for women to gain economic freedom through online platforms without a physical presence at the business premises.

Madawala et al. (2023) also highlighted the role of high self-efficacy among women as a catalyst for the courage to manage and lead digital businesses. Hazudin et al. (2022) showed that digital social networks such as WhatsApp groups or Facebook Community have accelerated the process of peer support and knowledge transfer among rural women entrepreneurs.

Ilyas et al. (2023) also emphasized the positive role of technology acceptance through the Technology Acceptance Model (TAM) which proves that the perception of usefulness and convenience plays a major role in women's digital empowerment.

Cross-Thematic Analysis

These four themes are interrelated and cannot be viewed in isolation. High digital literacy (Theme 1) increases women's ability to use technology effectively, but without access to strong infrastructure (Theme 2), this readiness cannot be optimally realized. Similarly, business performance (Theme 3) can only be achieved when technology is used with a planned strategy and based on community support and networks (Theme 4).

For example, women who have good digital literacy but are in areas with poor internet access will not achieve optimal performance despite having a strong digital marketing strategy (Faudzi et al., 2024; Pal & Bhowmick, 2024). According to Helmi et al. (2025), empowerment of women through community service has been contributing greatly towards closing the digital and cultural divide.

From the above synthesis, digitalization provides immense opportunities for women in the MSME sector in terms of achieving economic growth; however, this requires a combination of digital literacy and the effective use of this technology. The various studies

conducted provide a holistic viewpoint in this regard and recommend that for women digital entrepreneurship to gain momentum, there should be a combination of technology and community engagement (Mousa et al., 2024).

Key Tables for Subtopics

Theme	Corresponding Studies
1. Digital Readiness and Literacy	Helmi et al. (2025), Luthfia et al. (2025), Muafi et al. (2021), Sitaridis & Kitsios (2023), Faudzi et al. (2024)
2. Access to Technology and Infrastructure Barriers	Faudzi et al. (2024), Pal & Bhowmick (2024), Kang (2022), De Oliveira Malaquias & Malaquias (2022), Alom et al. (2025)
3. Business Performance and Sustainable Growth	Alom et al. (2025), Nayak et al. (2025), Aracil-Jordá et al. (2023), De Oliveira Malaquias & Malaquias (2022), Jha & Alam (2021)
4. Empowerment and Community Support	Mousa et al. (2024), Madawala et al. (2023), Hazudin et al. (2022), Ilyas et al. (2023), Ong et al. (2021)

Materials and Methods

This research applies Systematic Literature Review methodology in identifying and analyzing relevant literature that focuses on digital entrepreneurship and sustainable growth in MSMEs owned/led by women. The SLR methodology provides opportunities for gathering secondary data in a systematic and transparent manner (Tranfield et al., 2003; Snyder, 2019). This approach fits well in identifying research gaps and future research streams based on those gaps.

For this purpose, the research strictly follows the PRISMA protocol to reveal transparency in selecting articles for this piece. The PRISMA protocol includes search, screening, assessment, and synthesis of articles collected from credible sources (Page et al., 2021).

Search Strategy

The search strategy was developed based on a combination of keywords and the application of boolean search operators like “(digital entrepreneur* OR e-business OR online business) AND (woman OR women) AND (MSME OR SME OR microenterprise) AND (growth OR performance OR readiness)”. Keywords were modified using wildcards like “technolog*” for words like “technology”, “technological”, etc., and wildcards like “wom?n” for words like “woman”, “women”, etc., for a wider scope of search results.

This study focused on articles published between 2021 and 2025, and the data was obtained entirely from the Scopus database, in line with the journal quality requirements set for high-quality scholarly research. A total of 119 relevant articles were found through this process, and all search results were carefully recorded for transparency and replication purposes.

Selection Criteria

Inclusion criteria include:

- Articles in English;
- Published in a refereed journal;

- Containing full text;
- Directly related to the theme of digital entrepreneurship among women and MSMEs.

Exclusion criteria are:

- Articles in the form of editorials, short reports or abstracts only;
- Not directly related to the objectives of the study.

Data Analysis and Theme Classification

The selected articles were qualitatively analyzed and categorized into four main themes based on the similarity of content and study focus, namely:

1. Digital Readiness and Literacy;
2. Access to Digital Infrastructure and Tools;
3. Impact of Digitalisation on Business Sustainability;
4. Policy, Culture and Support Mechanisms.

This grouping was formulated based on a thematic analysis approach with reference to the strategy suggested by Braun and Clarke (2006) and the thematic synthesis process used in systematic literature reviews (Thomas & Harden, 2008).

Supporting Software

Mendeley software is used for reference management and duplicate article identification. In addition, document analysis and theme clustering are done manually based on concept maps built based on article titles and abstracts.

Theme Validation and Consensus

To ensure the reliability of the findings, the main themes identified are confirmed through peer review and the views of academic experts in the fields of digitalization and women's entrepreneurship. This triangulation process ensures thematic validity and supports the integrity of the analysis.

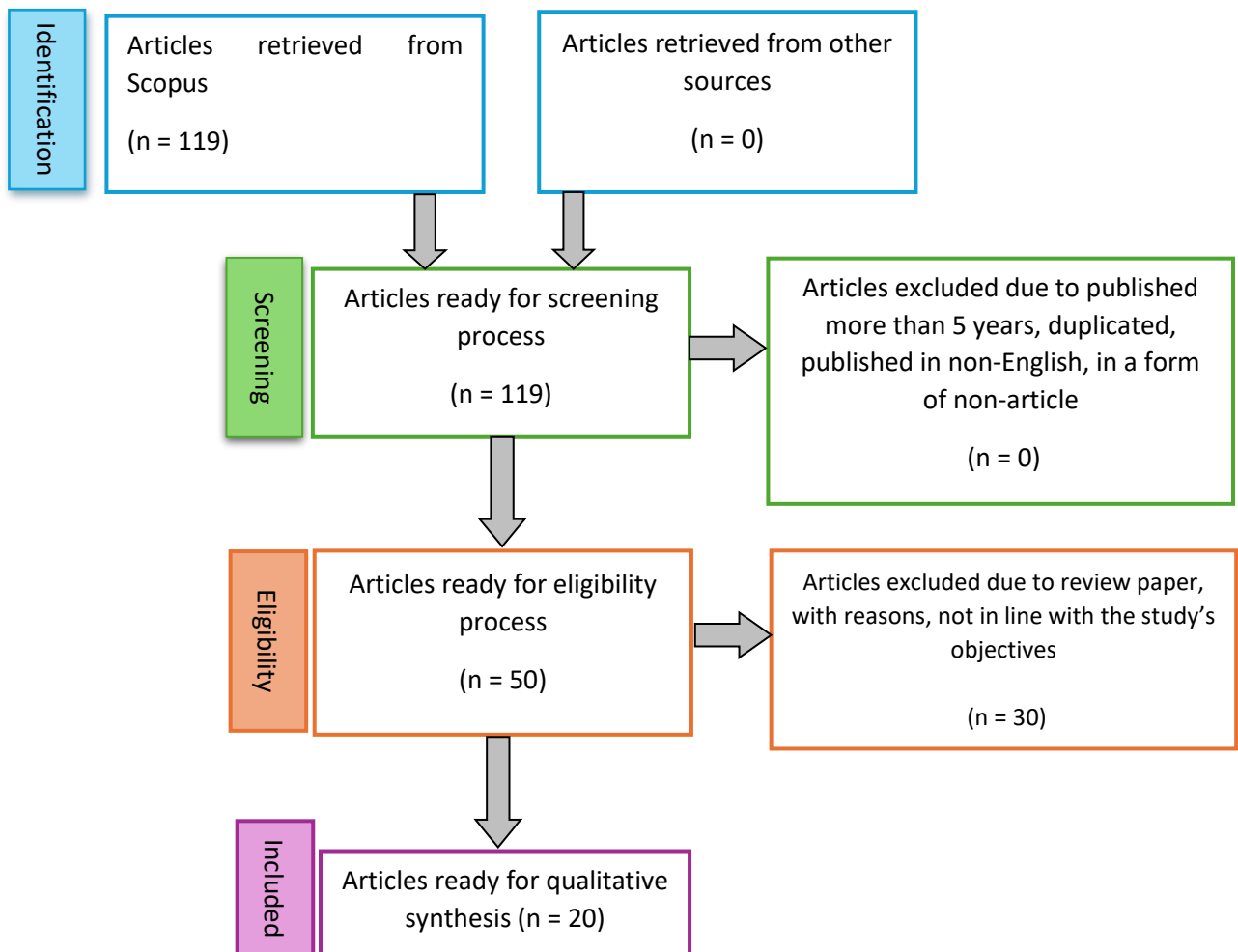


Figure 1. The PRISMA Figure

The PRISMA figure above shows the systematic process of selecting articles for this study using the Systematic Literature Review (SLR) approach. In the initial stage of the search, 119 articles were identified through a search in the Scopus database. After the initial screening and de-duplication process, all 119 articles proceeded to the title and abstract screening stage.

Among the first corpus of articles selected after screening the databases' titles/abstracts and key terms, 69 articles were eliminated because they do not address the topic or are out of the topic's scope. The next 50 articles are thoroughly screened based on the predetermined criteria of inclusions and exclusion. At this step, another 30 articles are eliminated because they do not address the issue of digital entrepreneurship based on empirical data among other reasons.

Finally, 20 articles were chosen based on the criteria and included in this thematic synthesis study. This figure helps ensure transparency and accuracy in reporting the study selection process.

This study presents the results of a systematic synthesis of 20 selected articles that were analyzed based on six quality assessment criteria (QA1–QA6) and showed an average quality score of 93.3%. These articles were screened from 119 articles obtained through the

Scopus database between 2021 and 2025, then summarized in the article selection process through the PRISMA Flow Diagram.

The findings were grouped into four main themes, namely: (1) Digital Readiness and Literacy, (2) Access to Technology and Infrastructure Barriers, (3) Business Performance and Sustainable Growth, and (4) Empowerment and Community Support. The following is a detailed explanation of each theme.

Theme 1: Digital Readiness and Literacy

Digital readiness refers to the readiness of women entrepreneurs to use digital technology including ICT literacy level, self-confidence and basic knowledge of digital platforms. Several studies have found that lack of digital literacy is a major barrier to women's active involvement in digital entrepreneurship (Helmi et al., 2025; Faudzi et al., 2024; Sitaridis & Kitsios, 2023).

Helmi et al. (2025) emphasizes the role of digital literacy in ensuring sustainable business growth among women-owned MSMEs. Within the context of previous literature, Muafi et al. (2021) highlights that human capital, especially the awareness of information and communication technology (ICT), assumes significant importance in terms of impacting attitudes towards the use of technology. From the perspective of developing economies, Faudzi et al. (2024) explain that women entrepreneurs often develop technological awareness through training initiatives, educational programs, or community-based support mechanisms.

Digital readiness is often linked with perceptions regarding the effectiveness and user-friendliness of technologies. Women entrepreneurs who perceive digital technologies as useful and easy to use tend to adopt digital platforms more actively for business activities such as marketing and customer engagement (Sitaridis & Kitsios, 2023; Muafi et al., 2021). Moreover, the development of digital literacy and technology-related capabilities significantly enhances women's participation in digital entrepreneurship and improves their ability to utilize digital platforms effectively (Luthfia et al., 2025).

Theme 2: Access to Technology and Infrastructure Barriers

The issue of access to technology entails the provision of technological support services and internet services. Various studies point out that there are significant barriers in accessing such infrastructure in relation to women entrepreneurs in rural areas (Faudzi et al., 2024; Pal & Bhowmick, 2024).

A study by Kang (2022) illustrates how the factors in the digital ecosystem impact the level of engagement of women in the digital economy. The challenges encountered in accessing the digital ecosystem by women entrepreneurs include high hardware costs, low internet penetration, and the absence of infrastructure. According to Alom et al. (2025), the absence of infrastructure prevents women entrepreneurs from incorporating digital methods in the business ecosystem, thus limiting the scope for business growth.

Using the Technology Acceptance perspective, Pal & Bhowmick (2024) point out that although women entrepreneurs exhibit a positive attitude towards entrepreneurial activities

and have the required skills in this regard, technological constraints are still among the significant barriers. Moreover, De Oliveira Malaquias and Malaquias (2022) identify that the ease with which women entrepreneurs access technology has a direct relationship with sustainability and innovation in women's entrepreneurship.

Theme 3: Business Performance and Sustainable Growth

This thematic analysis is centered on the effect of technology adoption on the performance of women-owned businesses. Different research studies have revealed a significant correlation between technology adoption and business performance (Alom et al., 2025; Nayak et al., 2025; Aracil-Jordá et al., 2023).

Alom et al. (2025) revealed that the adoption of digital finance is important for enhancing business efficiency as well as market expansion. According to research studies conducted by Aracil-Jordá et al. (2023) and Jha & Alam (2021), digital innovation helps improve the economic and social performance of women entrepreneurs and benefits their communities.

In addition, according to a study conducted by Nayak et al. (2025), digital entrepreneurship training is important to help women grow their businesses. However, according to a study conducted by De Oliveira Malaquias & Malaquias (2022), business success does not only depend on digital skills alone but also requires the use of sustainable marketing strategies to ensure business survival.

Theme 4: Empowerment and Community Support

Digital entrepreneurship has been seen as an empowering factor for women, not just on the financial side, but also on the social and psychological sides. This has been supported by Mousa et al. (2024) and Madawala et al. (2023), which revealed that when women are involved in community digital entrepreneurship activities, they are more confident and participate more in society.

The success of digitalization, according to Hazudin et al. (2022), not only depends on the skill set of the individual, but also on the social support provided to the women. Community support, NGOs, and government institutions are catalysts for the success of the digitalization activities for women, as revealed by Ong et al. (2021).

The success of community-based digital entrepreneurship activities for the empowerment of women and the creation of a digital business identity has been supported by Mousa et al. (2024). This has also been supported by the fact that community-based digital capacity-building activities for women's businesses are more successful, as revealed by the study by Ilyas et al. (2023).

Visual and Narrative Synthesis Integration

These four themes are explicitly referenced within Themes and Corresponding Studies, where the details of their methods and quality ratings are linked. All the themes were synthesized narratively along with empirical data gathered from the articles chosen for this study, besides the use of qualitative analysis as described in the Materials and Methods section.

This study has also utilized Figure 1: PRISMA Flow Diagram to describe the entire process of screening and selecting studies, besides the provision of statistics given in help.

Cross-Thematic Observations

There are clear interactions between themes, for example between digital literacy (Theme 1) and business performance (Theme 3), where high digital knowledge is often associated with increased sales revenue and growth strategies (Junaidi et al., 2021; Ibrahim et al., 2023). In addition, community support (Theme 4) helps overcome the problem of technology access (Theme 2), especially in the context of developing countries.

Discussion

This study provides a comprehensive understanding of the dynamics of digital entrepreneurship among women in MSMEs through a systematic synthesis of 20 high-quality articles. These results were grouped under four main themes, and were identified by the systematic searching process, following the PRISMA protocol, using targeted search terms.

Interpretation of Findings

The major findings indicate that the digital literacy and technology readiness skills of women entrepreneurs are low, which is a great hindrance to the adoption of digital technology (Helmi et al., 2025; Muafi et al., 2021). The insufficient knowledge and confidence levels to work with technology have affected the efficiency of business management of women-owned MSMEs (Sitaridis & Kitsios, 2023; Faudzi et al., 2024). This suggests that improving digital literacy is not just a basic skill, but a critical factor that determines whether a digital business can succeed. Without sufficient skills and confidence, technology adoption is only rudimentary and does not have a significant impact on business performance.

Women entrepreneurs face challenges in obtaining devices, internet access and digital facilities, especially in rural areas (Pal & Bhowmick, 2024; Kang, 2022). Without adequate infrastructure, they cannot fully engage in digital entrepreneurship (De Oliveira Malaquias and Malaquias, 2022; Faudzi et al., 2024). Therefore, digital transformation efforts cannot only focus on skills development but also need to address access and facilities issues.

The use of digital technology can increase the productivity, marketing and profitability of women's businesses (Alom et al., 2025; Nayak et al., 2025). In addition, digitalization is also important to ensure that businesses grow sustainably (Aracil-Jordá et al., 2023; Jha and Alam, 2021). This shows that digital technology is not just a supporting tool but can be a key strategy in growing and sustaining businesses in the long term.

Finally, digital technology helps empower women, but community support is also very important (Mousa et al., 2024; Madawala et al., 2023). Social networks also help women improve their skills and confidence in digital businesses (Hazudin et al., 2022; Ong et al., 2021). Therefore, community support helps to overcome the lack of skills and social support, thus ensuring that digital businesses can be run effectively and sustainably.

Implications

This study benefits multiple parties. Governments need to provide digital training and facilities to women entrepreneurs, especially in rural areas. Technology companies and

financial institutions also need to provide digital solutions that are suitable for women. In addition, community support is important to help share knowledge and increase the effectiveness of technology use. From a theoretical perspective, this study helps to explain the relationship between digital skills, technology access and business performance.

Comparison with Previous Studies

The findings obtained are also supported by literature that emphasizes the need for the development of digital skills for women entrepreneurs. Literature indicates that the level of digital skill and technological readiness affects the adoption of digital technology and business performance for women micro-enterprises (Helmi et al., 2025; Muafi et al., 2021).

Despite the positive effect of digital transformation, literature indicates that the effect of adopting digital technology is limited, particularly for micro-enterprises that face financial constraints, unless the micro-enterprise is provided with enough financial resources and institutional support to enable the success of the benefits of digitalization (Nayak et al., 2025; Hazudin et al., 2022).

Limitations of the Study

This study also recognizes several limitations. First, the searching was conducted on just one database (Scopus), which could potentially narrow the cultural and contextual ranges. Second, by including only published English-language articles, it is not possible to explore the regional experience published in other languages. Third, although inclusion and exclusion criteria were used to assess the papers, it has been conducted by individual assessment before peer review and could, therefore, potentially include bias.

On the other hand, the utilization of PRISMA guidelines and procedures depicted in Figure 1, along with the logical structure of analysis provided, improve the credibility of the study. The narrative and graphic syntheses add a holistic touch to the outcomes discussed.

Conclusion

This paper integrates learning from 20 selected articles and highlights pivotal topics to critically assess the impact of digital entrepreneurship on sustainable growth and women-centred micro, small, and medium-scale businesses (MSMEs). The findings show that although sustainable opportunities are generated by digital entrepreneurship, women MSMEs still face several barriers. These include low digital literacy (Helmi et al., 2025; Muafi et al., 2021), technology inequality and limited technological readiness (Sitaridis & Kitsios, 2023), as well as restricted access to digital platforms, infrastructure, and technological facilities (Faudzi et al., 2024; Kang, 2022).

With the help of technology such as e-commerce platforms, social media, and digital business tools, women entrepreneurs can improve their competitive advantage, expand customer reach, and increase business efficiency (Alom et al., 2025; Nayak et al., 2025; Aracil-Jordá et al., 2023). However, achieving these benefits requires a supportive digital ecosystem that includes access to training, financial resources, and networking opportunities (Hazudin et al., 2022; Ong et al., 2021). Furthermore, the research validates the applicability of the frameworks of digital technology adoption and entrepreneurial capability development with

respect to the participation of women entrepreneurs in the digital business environment (Ilyas et al., 2023; Mousa et al., 2024).

In terms of the implications of the research, the following aspects may be developed further. First, the research validates the applicability of the frameworks of digital technology adoption and entrepreneurial capability development with respect to the participation of women entrepreneurs in the digital business environment. In this context, more inclusive and gender-sensitive digital technology policies may be developed. These may include the implementation of women-specific digital technology training programs, digital technology infrastructure, and technology-specific incentives for women micro-entrepreneurs. In this context, the business sector may play a more significant role with respect to the design of more inclusive technology and the provision of opportunities for women entrepreneurs.

In terms of the research directions that may be developed further, the following aspects may be included. First, more qualitative research may be conducted to understand the real-life experiences of women entrepreneurs with respect to motivational, social, and psychosocial aspects that may not be fully examined from the perspective of quantitative research. Furthermore, comparative studies may be conducted with respect to developed and developing countries to understand the success factors of the digital transformation process with respect to women entrepreneurs in MSMEs. Lastly, future research should examine the long-term impact of emerging technologies such as artificial intelligence, blockchain, and big data on the sustainability and growth of women-owned businesses.

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