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# Analysing the Impact of Digital Knowledge, Technology Access, and Social Support on Women's Participation in Indonesian MSMEs

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Received: Apr. 18, 2025; Revised: Aug. 14, 2025; Accepted: Nov. 24, 2025

**Keywords:** Access to IT, Digital Literacy, Financial Literacy, Socio-Cultural Support, Women's Participation

**Abstract:** This study aims to analyse the influence of Digital Knowledge, Information Technology Access, and Socio-Cultural Support on Women's Participation in Entrepreneurship and test Financial Literacy's role as an intervening variable. This study uses the Partial Least Squares (PLS) method involving a sample of women in entrepreneurship. The study results show that Digital Knowledge, Access to Information Technology, and Socio-cultural Support positively and significantly affect Financial Literacy. In addition, the three independent variables also have a direct influence on Women's Participation in Entrepreneurship. Financial literacy plays a significant role as an intervening variable in strengthening the relationship between the independent and dependent variables. These findings suggest that increasing women's financial literacy can increase their participation in entrepreneurial activities. This study recommends developing financial literacy training, increasing access to information technology, and strengthening socio-cultural support to encourage women's entrepreneurship. These findings highlight the need for targeted policies and training programs that address the digital divide and promote gender-inclusive business practices. Collaboration between the government and the private sector is recommended to provide ongoing support in developing digital competencies and financial literacy for women Micro, Small, and Medium Enterprises (MSMEs) entrepreneurs. This study contributes to the entrepreneurship literature by highlighting the importance of financial literacy in bridging digital knowledge, technology access, and social support to women's entrepreneurial success.

## 1. INTRODUCTION

This research aligns with the Sustainable Development Goals (SDGs) agenda established by the United Nations. It particularly focuses on Goal 5, which promotes gender equality and women's empowerment, Goal 8, which emphasizes inclusive and sustainable economic growth, and Goal 9, which targets the development of resilient infrastructure, inclusive and sustainable industrialization, and innovation. The digital gender divide is a significant issue in the contemporary world, reflecting the disparity in access to and use of digital technologies by men and women. This gap limits women's opportunities to participate in the economy and hinders their ability to



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4 leverage digital tools for entrepreneurship. Indonesia is one of the developing countries in Southeast Asia, and its population is predominantly male. Statistical data shows that gender inequality in Indonesia in 2023 reached 0.447. The female labor market is 54.52, while for men, it is 84.26, which is very low compared to Brazil, the Republic of Korea, Canada, and the United States. In the Micro, Small, and Medium Enterprises (MSMEs) sector, the role of women is quite good. In 2021, the proportion of women-managed firms reached 58.5%. In Indonesia, the definition of MSMEs based on Government Regulation No. 7 of 2021, Micro Enterprises have annual sales of up to a maximum of IDR 2,000,000,000. Small Enterprises have annual sales of more than IDR 2,000,000,000.00 up to a maximum of IDR 15,000,000,000. Medium Enterprises have annual sales of more than IDR 15,000,000,000 up to a maximum of IDR 50,000,000,000 (Indonesia Government, 2021). MSMEs have become significant drivers of economic development, with women playing a critical role in the sector. However, a lack of digital skills and financial literacy poses challenges for women entrepreneurs, especially in rural areas with limited access to technology and education (Hilbert, 2011). This gap is particularly pronounced in developing countries, where socio-economic and cultural factors often exacerbate women's challenges in accessing digital resources. Understanding the digital gender gap is critical to promoting gender equality and empowering women in the digital age.

MSMEs run by women in Indonesia cover many sectors, including trade, industry, and tourism. The role of women as housewives does not hinder their opportunities to become entrepreneurs. In several tourist destinations in Indonesia, women can try to generate additional income for their families by setting up homestays in tourist villages or providing culinary delights to complement tourism. As the largest consumers of fashion products, women are also essential producers in Indonesia's garment industry. The percentage of women's participation in the manufacturing sector reached 16.7%. Women's involvement in the workforce reached 51.88%, while the unemployment rate for women in 2018 was lower than men's 5.26%. Women's participation in the digital economy is based on women's access, especially for MSME entrepreneurs, to digital technology. Digital literacy is very significant for women MSME entrepreneurs in this digital era. By understanding technology and the Internet, women MSME entrepreneurs can access online resources to expand market reach, improve operational efficiency, and strengthen their presence in the digital business ecosystem. Digital literacy allows them to use digital tools like social media, e-commerce platforms, and business software to promote their products, build customer relationships, and manage inventory and financial transactions more efficiently. In addition, with strong digital literacy, women MSME entrepreneurs can develop new skills, increase their business competitiveness, and contribute significantly to local and global economic growth. The economic aspect is the most vulnerable component in community empowerment initiatives post-COVID-19 pandemic (Yuliastuti et al., 2024). This finding aligns with the context of the women's MSMEs studied in this study, where digital-based interventions and financial literacy are key to strengthening sustainable economic capacity. Digital skills and internet access for women in Indonesia vary depending on various factors, including geographic location, education level, and financial status. Generally, the level of digital skills among women still tends to be lower than that of men. Despite significant increases in internet penetration in Indonesia, there is a gender gap in internet access and usage. Women in urban areas have better internet access

than those in rural or remote areas. In addition, challenges are still related to the lack of digital literacy and limited access to information and communication technology infrastructure, limiting women's ability to utilise the Internet's full potential in supporting their businesses, including MSMEs entrepreneurs. Efforts continue to be made by the government, non-governmental organisations, and the private sector to reduce the gender digital divide and increase access and understanding of digital technology among Indonesian women. In Indonesia, social and cultural support for women's entrepreneurship significantly encourages the growth and development of women's businesses. The strong culture of cooperation and togetherness in Indonesian society often provides essential social support for women who want to start their businesses. In addition, social norms that are increasingly accepting of economically active women are also important factors in building a climate conducive to women's entrepreneurship (Prabawanti et al., 2023). Support from family, friends and local communities can provide valuable social capital, including financial assistance, business knowledge and extensive networks. Moreover, government and non-governmental organisation initiatives in providing training, mentoring, and access to resources for women entrepreneurs also play an important role in strengthening the women's entrepreneurship ecosystem in Indonesia. All of this helps stimulate greater creativity, innovation and economic contribution from women entrepreneurs, which in turn can strengthen women's economic standing and drive overall economic growth. Based on the background and previous research, and considering the emerging issues, it is necessary to analyze the influence of Digital Knowledge, Access to Information Technology, and Social Support on Women's Participation in Entrepreneurship and examine the role of Financial Literacy as an intervening variable. This study seeks to contribute to enriching the literature on women's entrepreneurship by identifying the role of financial literacy as a significant mediator in the relationship between digital knowledge, technology access, social support, and women's participation in entrepreneurship (Figure 1).

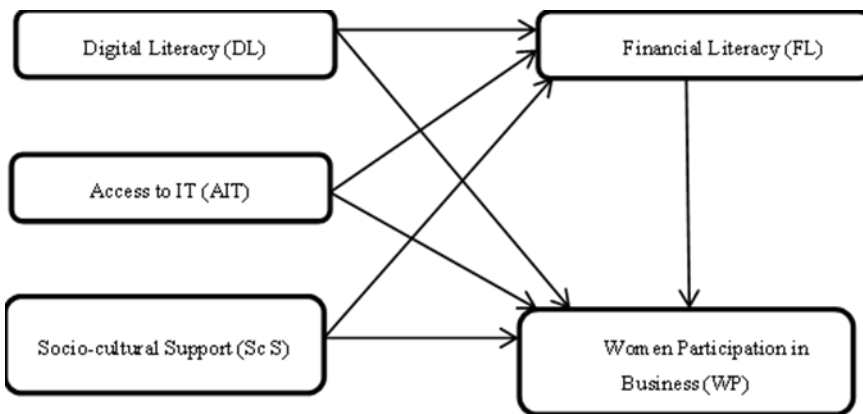


Figure 1. Proposed conceptual model (Source: Author, 2025)

## 2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

### 2.1 Women's digital knowledge and financial literacy

22 Digital literacy refers to an individual's ability to use digital technology effectively, including skills in navigating the internet, utilising financial applications, and conducting e-commerce activities (Susiana, 2023). In the context of women entrepreneurs, digital literacy plays a crucial role because it can open access to broader markets, improve operational efficiency, and encourage innovation, aligning with SDGs 5B, increasing the use of technology. Previous studies have shown that women with high levels of digital literacy are better able to adopt technology-based business practices, thereby increasing business competitiveness and sustainability (Hamid et al., 2020). Therefore, in this study, digital literacy was chosen as the primary independent variable, not only because it reflects a set of skills but also because it serves as a catalyst for overcoming traditional market barriers often faced by women MSMEs.

68 Higher levels of financial literacy were associated with increased frequency of internet use and greater travel distance (Hong et al., 2020). This study suggests that financial literacy, as a form of numeracy, is vital in how individuals engage with information and communication technologies (ICT). Financial literacy can increase ICT use, influence travel behaviour, and highlight the importance of developing these skills to reduce social exclusion in the digital age. Anugraini et al. (2023) highlighted that financial technology, as a component of information and communication technology, significantly affects financial literacy. It emphasises that higher levels of financial literacy increase the use of financial technology, positively affecting financial management. This study shows that individuals with better financial literacy are more likely to effectively engage with financial technology services, thereby improving their financial decision-making and management skills. This relationship underscores the importance of integrating technology in improving financial literacy. Digital literacy can facilitate access to financial education and financial services, enabling entrepreneurs to secure funding and manage their finances more effectively. Digital literacy in the entrepreneurial ecosystem illustrates how digital platforms and mobile technologies connect entrepreneurs with potential investors, customers, and resources, ultimately driving innovation and economic growth (Wellalage & Fernandez, 2019).

21 H<sub>1</sub>: Women's digital knowledge positively affects financial literacy.

### 2.2 Women's Information Technology access and financial literacy

Access to information technology encompasses the availability and ease of use of digital devices, internet connectivity, and other related digital infrastructure. Availability of adequate access to technology is essential for achieving SDGs 9C. For women entrepreneurs, particularly in developing countries, this level of access significantly determines their ability to participate in digital platforms, obtain timely market information, and build connections with customers and suppliers. Empirical evidence suggests that gaps in technology access often reflect socioeconomic and geographic inequalities, with women living in rural areas tending to be at a disadvantage (Hamid et al., 2020). Therefore, this variable is crucial for understanding how

3 infrastructure inclusiveness can shape women's participation in entrepreneurial activities. Improved digital infrastructure is significantly correlated with a reduction in the digital financial divide, and this can improve financial literacy by providing better access to financial services and information (Ferilli et al., 2024). Technological infrastructure, especially digital technology, is critical in improving financial literacy in Sub-Saharan Africa. Promoting awareness of financial services available through digital platforms can bridge the financial knowledge gap. Investment in technological infrastructure and human resources is essential, as financial literacy significantly contributes to financial stability and inclusion. Thus, improving technological infrastructure is critical to fostering greater financial literacy among the population, ultimately leading to increased financial inclusion (Kouladoum et al., 2022). Integrating digital and financial literacy programs specifically designed for women can significantly improve their access to knowledge, connectivity, and entrepreneurial opportunities. Technological infrastructure significantly impacts financial literacy, especially for women. Access to digital tools improves women's ability to gain financial knowledge and make informed economic decisions.

H<sub>2</sub>: Women's Information Technology access positively affects financial literacy.

### 2.3 Socio-cultural support for women and financial literacy

58 Socio-cultural support refers to the social networks, community backing, and cultural norms that influence women's economic participation. From the perspective of the SDGs agenda, socio-cultural support promotes policies that foster productive activities, create decent jobs, encourage entrepreneurship, and stimulate creativity and innovation. This support can either empower or hinder their efforts (Barghouthi et al., 2024). Positive socio-cultural support includes mentorship, encouragement from family, and community acceptance of women entrepreneurs, all of which are crucial for fostering successful business ventures. On the other hand, restrictive cultural norms can severely limit women's mobility, decision-making power, and access to essential resources (Fauzi et al., 2020). Research from Southeast Asia and Africa provides strong evidence that robust socio-cultural support networks significantly enhance the success rates of women entrepreneurs by offering moral encouragement and practical resources (Barghouthi et al., 2024). Thus, this study emphasises socio-cultural support as an important variable, as cultural attitudes and community engagement play a vital role in shaping opportunities for women to engage in micro, small, and medium enterprise (MSME) activities. Socio-cultural factors, including support systems, influence financial literacy among different demographics, especially women (Bottazzi & Lusardi, 2021). Previous studies highlight that societal stereotypes and expectations can affect women's beliefs and engagement with financial literacy, including financial accounting. Findings suggest that increased socio-cultural support can improve women's financial literacy by fostering a more positive environment for learning and applying financial skills, ultimately enhancing women's financial empowerment. Women's self-efficacy, supported by cultural factors, supports financial literacy skills and significantly influences financial wealth, with variations observed across gender and education levels (Banner & Schwarz, 2018). Higher financial accounting literacy and self-efficacy are associated with a

more significant accumulation of financial wealth. It can be concluded that, socio-culturally, women may face unique challenges in having sufficient financial literacy, which may affect their financial decision-making and ability to build wealth compared to men.

H<sub>3</sub>: Socio-cultural support for women has a positive effect on financial literacy.

## 2.4 Digital knowledge and women's participation in entrepreneurship

Digital skills are becoming increasingly important in today's technology-driven world, especially for women entrepreneurs who want to thrive in the digital economy. These skills encompass a range of competencies, including using digital devices, navigating online platforms, and leveraging technology for business growth (Nambisan et al., 2019). The role of digital skills in empowering women entrepreneurs is multifaceted, affecting their ability to access markets, manage business operations, and enhance their competitiveness. Digital skills enable women entrepreneurs to streamline their business operations, making them more efficient and effective. Women can manage their businesses more effectively by leveraging digital tools such as accounting software, customer relationship management systems, and online marketing platforms. Digital tools save time and resources and allow them to focus on strategic growth initiatives. For example, platforms like Bukalapak and Tokopedia provide tools to help female entrepreneurs manage transactions and track financial performance in real-time, improving their operational efficiency. Digital skills also play a vital role in improving financial management and literacy among women entrepreneurs. With the ability to use digital financial tools, women can better manage their finances, track expenses, and make informed financial decisions. The condition is critical in developing countries, where access to traditional financial services may be limited. Programs that provide digital financial literacy training have been shown to improve women's ability to manage their businesses and access credit, thereby supporting their entrepreneurial ventures. Despite the benefits, women entrepreneurs often face barriers to acquiring digital skills, including limited access to technology and training opportunities. Overcoming these barriers is critical to empowering women in the digital economy. Initiatives that provide affordable access to digital tools and training programs can help bridge the digital skills gap. In Indonesia, government and private sector initiatives have focused on delivering digital skills training for women entrepreneurs, helping them overcome these barriers and succeed in the digital economy. Digital skills are critical to women's entrepreneurship, providing the tools and skills needed to succeed in the digital economy. By improving business operations, expanding market access, and enhancing financial management, digital skills empower women entrepreneurs to overcome challenges and achieve sustainable growth. Investment in digital skills training and access to technology is essential to support women's economic empowerment and drive inclusive economic development. Financial capability is one of the factors in utilising digital opportunities and significantly increases women's participation in opportunity-driven entrepreneurship, showing a positive correlation between digital readiness and women's entrepreneurial activities (Moeini Gharagozloo et al., 2023). Hammad & El Naggari (2023) study found that the development and utilisation of online social capital plays a significant role in the entrepreneurial

opportunity process of nascent women entrepreneurs, highlighting the importance of utilising social media platforms for networking and resource acquisition, so it is essential for women to have digital skills.

H4: Digital knowledge positively affects women's participation in entrepreneurship.

## 2.5 Information Technology and women's participation in entrepreneurship

The digital gender divide refers to the gap between men and women in access to digital technologies, including the Internet, mobile devices, and digital literacy. Various factors, including socio-cultural norms, economic constraints, and educational disparities, influence this gap. In many developing countries, women are less likely than men to own digital devices or access the Internet, limiting their ability to participate in the digital economy and access online information and services. Socio-cultural norms play a significant role in perpetuating the digital gender divide. In many societies, traditional gender roles and expectations limit women's opportunities to engage with technology. For example, women may be less motivated to pursue education or careers in technology-related fields, leading to low levels of digital literacy and confidence in using digital devices. Economic barriers also contribute to this gap, as women in developing countries often have less financial independence and access to the resources needed to purchase digital devices or pay for internet services. The digital gender divide broadly affects women's economic empowerment and participation. Access to digital technologies can provide women with opportunities to improve their education, access healthcare information, and engage in entrepreneurial activities. However, lack of access to these technologies can limit women's ability to take advantage of these opportunities, thereby perpetuating the cycle of poverty and inequality. Bridging the gender digital divide is critical to promoting gender equality and empowering women to participate fully in the digital economy. Access to technology and the Internet significantly impacts women's participation in entrepreneurship, especially in the tourism sector in Latin America (Khoo et al., 2024). The study highlights that women tourism entrepreneurs face barriers such as a lack of access to digital tools, infrastructure, and training, which hinder their ability to leverage digital platforms effectively. These challenges contribute to the macro gender digital divide, limiting women's opportunities to develop critical digital competencies needed for business growth and empowerment in the digital economy.

In contrast Abdelwahed et al. (2024) found that technology orientation had no significant impact on women's empowerment, and digital innovation served as a mediator in the relationship between entrepreneurial orientation and women's participation in entrepreneurship. Khoo et al. (2024) found that the lack of digital competencies among women tourism entrepreneurs in Latin America hinders their ability to utilise technology and digital platforms fully. Challenges such as limited access to digital devices, infrastructure, and training, dependence on support staff and family members, and concerns about safety, security, and work-life balance act as barriers to women's tourism business growth in the region. Research by Rajeev & Bhandarkar (2022) suggests that telecommunications infrastructure that enables access to online platforms significantly empowers women in developing countries by allowing them to engage in income-generating activities, thereby reducing gender-

12 based deprivation and disparities in their communities. There is a correlation between gender inequality and the use of information and communication technologies by women-owned firms, suggesting that areas with higher gender inequality tend to have lower levels of ICT use, which may hinder the success of women entrepreneurs.

H<sub>5</sub>: Access to information technology positively affects women's participation in entrepreneurship.

## 8 2.6 Socio-cultural support and Women's participation in entrepreneurship

47 Socio-cultural support plays a vital role in shaping the entrepreneurial landscape for women, particularly in areas where traditional norms and societal structures significantly influence economic activities. This support includes encouragement and resources provided by family, community, and cultural institutions, which can facilitate or hinder women's entrepreneurial endeavors. Understanding the dynamics of socio-cultural support is critical to fostering an environment that enables women to thrive as entrepreneurs. Socio-cultural support is crucial for women entrepreneurs because it provides the social capital necessary for business success. This support often comes through family encouragement, community networks, and cultural practices that promote collaboration and mutual aid. In many communities, women rely on these networks to gain access to resources, information, and markets that they may not otherwise have access to. For example, in West Java, the cultural practice of "gotong-royong," or cooperation, is critical in supporting women's entrepreneurship by fostering a sense of community and shared responsibility.

2 Family and community networks are essential components of socio-cultural support for women entrepreneurs. This network provides emotional support, financial assistance, and practical help in managing business operations. In many cultures, family members are actively involved in business activities, offering labor and expertise. In-group support significantly influences women's participation in entrepreneurship, especially in countries with strong national cohesion values. This support helps narrow the gender gap in entrepreneurship by increasing the entrepreneurial activity of young women relative to young men. Findings suggest that both micro-level (in-group support) and macro-level (cultural values) factors play essential roles in encouraging female entrepreneurship, implying that social and cultural support systems are critical to encouraging female entrepreneurs (Weiss et al., 2023). In Indonesia, support from family and community is an important factor in the success of MSMEs managed by women. The involvement of family members in business activities provides practical support and increases entrepreneurs' self-confidence and motivation. Cultural practices and traditions can significantly influence women's entrepreneurial activities. In some cultures, traditional practices such as community gatherings, religious events, and local markets provide a platform for women to showcase their products and services. These cultural events often serve as networking opportunities, allowing women to build relationships with potential customers and partners. In Bali, for example, integrating business activities with cultural and religious events gives women entrepreneurs a unique opportunity to promote their businesses within the community. Despite its benefits, socio-cultural support can also present challenges for women entrepreneurs. In some societies, traditional gender roles and expectations can limit women's participation in entrepreneurial activities. Cultural norms prioritizing

domestic responsibilities over business matters can hinder women's ability to engage in entrepreneurship fully. Overcoming these challenges requires a deep understanding of the socio-cultural context and the development of strategies that empower women while respecting cultural traditions (Ikhsano et al., 2015). Research in the West Bank of Palestine shows that the success of female entrepreneurs in SMEs is positively and significantly influenced by the need for achievement as an internal factor and economic factors and family support as external factors (Barghouthi et al., 2024).

In addition, socio-cultural factors do not show a significant moderating effect. By gaining knowledge about the relationship between internal and external factors and the success of women-owned SMEs, this study adds to the existing body of literature. These factors can be considered in the success of these companies, especially in an environment full of political and economic fluctuations. In addition, this study is said to be the first of its kind in Palestine, especially regarding women-managed SMEs. It also supports entrepreneurs by providing them with resources to help their businesses grow and succeed.

Socio-cultural support is essential for women's entrepreneurship, providing the social capital and networks necessary for business success. Women entrepreneurs can overcome barriers and access resources that improve business operations by leveraging family and community support. However, addressing socio-cultural challenges that may limit women's entrepreneurial potential is critical. Continued efforts to promote inclusive cultural practices and support networks are essential to empower women entrepreneurs and drive sustainable economic development (Tremblay et al., 2016; UNDP, 2019). Research in Indonesia shows that social support significantly influences women's entrepreneurial intentions, primarily when mediated by self-efficacy. Women entrepreneurs in the Batik MSMEs sector in West Java, Indonesia, experience social challenges, but positive social support increases their self-confidence and intentions to engage in entrepreneurship. In addition, gender stereotype perceptions also play an important role, directly affecting self-efficacy and entrepreneurial intentions. Thus, social and cultural support is essential to encourage women's participation in entrepreneurial activities (Hamdani et al., 2023).

H<sub>6</sub>: Socio-cultural support positively influences women's participation in entrepreneurship.

## 2.7 Financial literacy and women's participation in entrepreneurship

Financial literacy significantly influences women's participation in entrepreneurship by increasing their entrepreneurial intentions and motivation (Lladós-Masllorrens & Ruiz-Dotras, 2022). This study shows that financial and numeracy skills can improve the culture of entrepreneurship, helping women overcome reluctance and recognise business opportunities. In addition, these skills are particularly impactful when women are motivated to increase their autonomy and income. The introduction of financial content in education can further enhance entrepreneurial intentions among women, highlighting the importance of financial literacy in fostering female entrepreneurship. Xu & Jiang (2024) The study also stated that financial literacy positively influences women's participation in entrepreneurship. Women with higher financial literacy are more likely to engage in entrepreneurial activities, as it improves their risk attitude and expands their social networks. This suggests that

improving financial literacy among women can significantly increase their entrepreneurial engagement, thereby contributing to greater gender equality in entrepreneurship and economic participation.

Financial literacy is an essential skill that empowers individuals to make informed and effective decisions regarding their financial resources. Financial literacy is particularly important for women as it can significantly impact their economic independence, ability to manage personal and business finances, and overall empowerment. Despite its importance, many women, especially in developing countries, face challenges in acquiring financial literacy due to socio-economic and cultural barriers (Oggero et al., 2020). Financial literacy enables women to understand and effectively utilise financial services, manage personal and business finances, and plan for future financial security. Financial literacy encompasses a range of skills, including budgeting, saving, investing, and understanding credit. For women entrepreneurs, financial literacy is essential for managing business operations, accessing credit, and making strategic financial decisions. In Indonesia, for example, financial literacy has been recognised as a critical factor in the success of women entrepreneurs in the micro, small, and medium enterprises (MSME) sector. Several barriers hinder women's access to financial literacy, including limited access to education, socio-cultural norms, and economic constraints. In many societies, traditional gender roles may limit women's opportunities to pursue education or participate in financial decision-making (Leitch & Hill, 2006). Financial literacy and digital skills significantly impact women's participation in entrepreneurship by enabling them to make informed economic decisions (Mishra et al., 2024). Financial skills, including financial literacy and accounting skills, significantly influence women's entrepreneurial intentions (Lladós-Masllorrens & Ruiz-Dotras, 2022). This study shows that these skills can improve the culture of entrepreneurship, reduce risk aversion, and increase awareness of business opportunities. Women who are motivated to increase their autonomy and income are strongly influenced by financial competencies.

Furthermore, integrating financial content into education can further increase entrepreneurial intentions among women, highlighting the need for policymakers to focus on financial education to encourage women's entrepreneurship. This empowerment increases financial independence and resilience, helping women overcome traditional socio-economic barriers like poverty. This paper emphasises that improving financial accounting skills is crucial for women, as it increases their confidence in managing finances and opens doors to entrepreneurial opportunities, ultimately contributing to sustainable development goals.

Additionally, women in rural areas often lack access to financial education programs and resources, further exacerbating the financial literacy gap. This barrier is particularly evident in Indonesia, where women in rural areas face financial education and technology challenges. Efforts to improve women's financial literacy have focused on providing education and training programs tailored to their needs. Governments and non-governmental organisations have implemented initiatives to improve financial literacy among women, particularly in developing countries. In Indonesia, programs facilitated by the Ministry of Cooperatives and SMEs and the Financial Services Authority (OJK) have significantly improved financial literacy among women entrepreneurs. These programs provide essential training in accounting, financial management, and digital financial tools, helping women better manage their businesses and access formal financial services. Improving women's financial literacy significantly impacts their economic

empowerment and participation. Women with higher financial literacy are better equipped to manage their finances, access credit, and make informed financial decisions (Brush et al., 2009; Fauzi et al., 2020). This increases their economic independence and contributes to broader economic development. In Indonesia, women entrepreneurs who have received financial literacy training have demonstrated improved business performance and greater access to financial resources, highlighting the transformative potential of financial literacy. Financial literacy is a critical component of women's empowerment and economic participation. By addressing barriers to financial literacy and providing targeted education and training programs, stakeholders can improve women's financial capabilities and support their economic independence. Continued efforts to improve financial literacy among women are critical to fostering inclusive economic development and promoting gender equality.

H<sub>7</sub>: Financial literacy positively affects women's participation in entrepreneurship

### 3. METHODS

This study employs a quantitative research design, using structural equation modelling (SEM) to analyse the relationship between digital knowledge, access to technology, social support, financial literacy, and women's participation in MSMEs. It includes all women MSMEs entrepreneurs in Indonesia. A non-probability sampling technique was used, combining quota sampling to ensure sufficient respondent numbers from each target group and snowball sampling to recruit additional participants through referrals or recommendations from previous respondents. This approach was deemed suitable because it could reach women entrepreneurs not yet listed in formal databases. However, both methods have limitations, particularly the potential for sampling bias, as the respondents obtained may not fully represent the entire population of women entrepreneurs in Indonesia. As a result, the findings cannot be fully generalised to all women entrepreneurs in Indonesia. Participants were recruited by distributing questionnaires during training sessions for female MSMEs, conducting direct visits to business premises, and utilising e-forms shared via social media. Inclusion criteria required respondents to be women who own and manage MSMEs independently, while exclusion criteria included those unwilling to complete the questionnaire. This sampling approach was selected due to time and resource constraints and the challenges of accessing the entire population of female MSMEs entrepreneurs across Indonesia. The questionnaire comprises questions describing each variable studied, with responses recorded on a 1-5 Likert scale.

Independent Variables: Digital Knowledge (DK): Individual knowledge in using digital technology, including financial app use, internet navigation, and e-commerce activities. Access to Information Technology (AIT): Individuals easily access information technology. Socio-cultural Support (Sc S): Social and cultural support obtained by individuals in carrying out economic activities. Intervening Variables: Financial Literacy (FL): Individual understanding of financial accounting. Dependent Variable: Women's Participation in Business (WP): The level of women's involvement in business activities. Data were analysed using SmartPLS software, focusing on testing path coefficients and the significance level of the relationship between variables.

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## 4. RESULT AND DISCUSSION

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### 4.1 Result

This study investigates the impact of various factors on women's participation in Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. The findings highlight the importance of digital skills, access to technology, socio-cultural support, and financial literacy in enhancing women's entrepreneurial activities (Table 1, Table 2, Table 3, Table 4, and Figure 2).

Table 1. Respondent Demographics (Source: Author, 2025)

Characteristics	Frequency	Percentage	
Age	20-30 Years	75	17%
	31-40 Years	117	27%
	41-50 Years	178	41%
	≥ 51 years	68	16%
Education	Junior High School	32	7%
	Senior High School	140	32%
	Diploma/Bachelor	209	48%
	Postgraduate	57	13%
Entrepreneurial Experience	< 1 year	51	12%
	1-5 years	144	33%
	6-10 years	177	40%
	>10 years	66	15%
Technology and Internet Access	Good	154	35%
	Enough	182	42%
	Bad	102	23%
Province	East Java	124	28%
	Central Java	55	13%
	West Java	40	9%
	Jakarta	46	11%
	Yogyakarta	63	14%
	West Nusa Tenggara	39	9%
	Bali	39	9%
	West Sumatra	32	7%

Table 2. Assessment of measurement model (Source: Author-Smart PLS4 output, 2025)

Construction	Item	Loading	Cronbach's alpha	CR	AVE
Digital Knowledge	<i>I can use digital financial applications (such as mobile banking or digital wallets) well.</i>	0.952	0.952	0.965	0.873
	<i>I feel confident searching for information online.</i>	0.940			
	<i>I am familiar with using e-commerce to sell or buy products.</i>	0.920			
	<i>I know how to keep my data secure when using digital platforms.</i>	0.925			
Access to IT	<i>I have adequate internet access to run my business activities.</i>	0.904	0.940	0.954	0.806
	<i>I have devices such as a smartphone or laptop that support my business activities.</i>	0.910			

Construction	Item	Loading	Cronbach's alpha	CR	AVE
	<i>I easily obtain business information through digital media.</i>	0.901			
	<i>I can access online training or educational information.</i>	0.893			
	<i>I have an online network or community that supports my business activities.</i>	0.880			
Socio-cultural Support	<i>My family supports me in running my business.</i>	0.885	0.952	0.962	0.807
	<i>The surrounding environment (neighbors/community) supports women in entrepreneurship.</i>	0.921			
	<i>I feel valued by society for my role as a female entrepreneur.</i>	0.927			
	<i>Cultural norms in my area encourage women to be economically active.</i>	0.909			
	<i>I receive moral or emotional support from friends or business associates.</i>	0.860			
	<i>I feel safe and socially accepted as a woman running a business.</i>	0.885			
Financial Literacy	<i>I understand how to prepare simple financial reports for my business.</i>	0.923	0.954	0.964	0.844
	<i>I can differentiate between profit and cash flow.</i>	0.916			
	<i>I understand the importance of recording income and expenses regularly.</i>	0.932			
	<i>I understand the concepts of accounts payable, receivables, and how they are managed in business.</i>	0.904			
	<i>I can develop a financial plan to grow my business.</i>	0.919			
Women Participation in Business	<i>I am actively involved in daily business activities.</i>	0.892	0.955	0.965	0.846
	<i>I play a significant role in business decision-making.</i>	0.935			
	<i>I regularly participate in training or business development activities.</i>	0.935			
	<i>I have primary responsibility for running business operations.</i>	0.938			



Construction	Item	Loading	Cronbach's alpha	CR	AVE
	<i>I have aspirations to grow my business in the future.</i>	0.899			

Table 3. Discriminant Validity (HTMT) (Source: Author-Smart PLS4 output, 2025)

Indicators	AIT	DK	FL	Sc S	WP
AIT					
DK	0.856				
FL	0.852	0.865			
Sc S	0.821	0.858	0.853		
WP	0.863	0.898	0.876	0.885	

Table 4. Direct Effects (Path coefficients) (Source: Author-Smart PLS4 output, 2025)

Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
AIT -> FL	0.296	0.297	0.057	5,227	0,000
AIT -> WP	0.183	0.183	0.039	4,744	0,000
DK -> FL	0.326	0.325	0.050	6,564	0,000
DK -> WP	0.307	0.306	0.040	7,627	0,000
FL -> WP	0.204	0.205	0.038	5,377	0,000
Sc S -> FL	0.317	0.317	0.046	6,874	0,000
Sc S -> WP	0.285	0.286	0.034	8,465	0,000

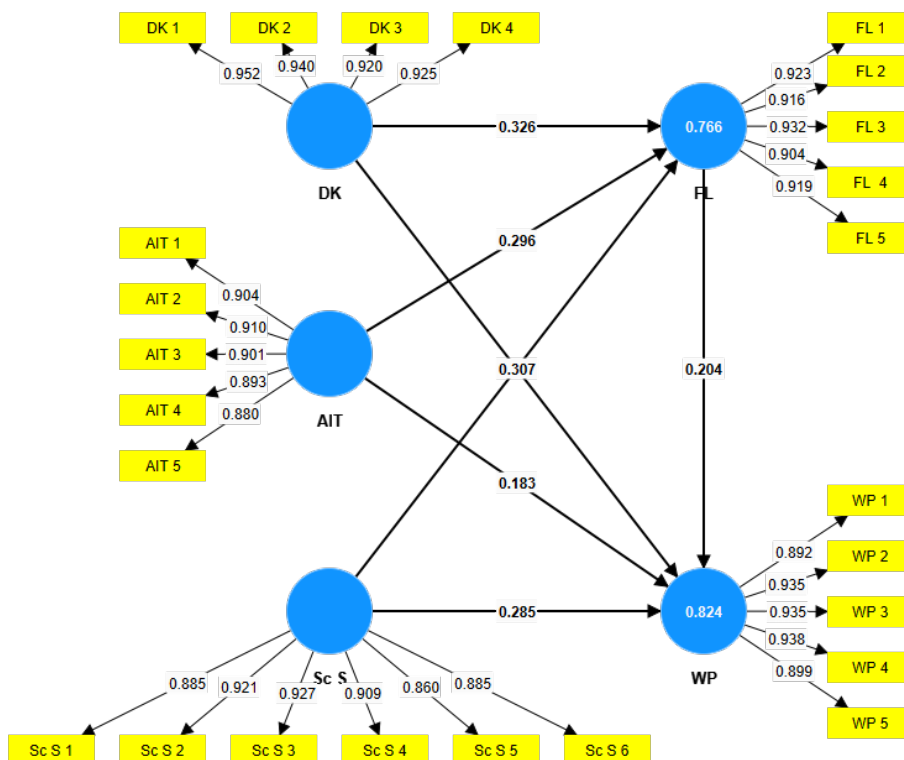


Figure 2. Algorithm test results (Source: Author-Smart PLS4 output, 2025)

## 4.2 Discussion

5 The findings of this study have important implications for achieving several Sustainable Development Goals (SDGs). Enhancing women's digital literacy and access to technology supports empowerment as described in Goal 5. Additionally, socio-cultural support mechanisms foster inclusive economic participation, which aligns with Goal 8. Moreover, strengthening digital infrastructure for women-owned micro, small, and medium enterprises (MSMEs) corresponds to Goal 9, which aims to promote innovation and sustainable industrialization.

### 4.2.1 Relationship between digital knowledge and financial literacy

43 The study results show that women's digital knowledge (DK) positively and significantly influences financial literacy (FL). The results indicate that the better women can understand and use digital technology, the better their ability to understand, manage, and make financial decisions. In the digital era, the ability to use financial applications, e-wallets, and e-banking platforms is closely related to managing finances effectively. Digital knowledge allows women to access financial information more easily. Digital knowledge also helps women access financial resources that may have previously been difficult to reach, such as microfinance, digital insurance, or online investment. With increased financial literacy, women can make better financial decisions, manage budgets, and plan for their financial future.

### 4.2.2 Women's information technology access and financial literacy

3 14 Women's Technology Access (AIT) positively affects Financial Literacy (FL) with a Path coefficient of 0.296 and a p-value of 0.000, indicating that this relationship is very significant. It can be said that the better women's access to technology, the higher their level of financial literacy. Access to technology gives women the tools to understand financial information, such as through digital financial applications, financial planning tools, and online education platforms. Technology also provides real-time information that helps women make better financial decisions. The dimensions of technology, infrastructure, and governance are key aspects in developing strategies tailored to the local context (Yandri et al., 2024). This reinforces our finding that women's empowerment in the MSME sector is inextricably linked to the readiness of digital infrastructure and regional institutional support.

### 4.2.3 Social-cultural support and financial literacy

9 Social support for women (Sc S) has a positive effect on Financial Literacy (FL) with a Path Coefficient of 0.228, meaning that the greater the social support women receive, the higher their level of financial literacy. Social support can come from family, friends, or communities that encourage, inform, and motivate women to improve their financial knowledge. This support also includes access to discussion groups, financial training, or guidance from mentors. Social support can help women more easily understand financial concepts, such as budget planning, investment, or debt management, through sharing or learning experiences. A supportive social environment increases women's confidence in making financial decisions. Sociocultural support for women's participation in MSMEs can help them

achieve a more balanced work-life approach ([Chasanah, 2025](#)). In social studies, inclusive and community-based governance, such as that found within families, can enhance socioeconomic resilience ([Santoso et al., 2024](#)). This research demonstrates that women, with the support of family, friends, neighbours, or the community, are encouraged to own or develop their businesses. Similarly, the business cluster related to efforts to preserve handicrafts through spatial and cultural engagement underscores the role of collective identity in empowering local entrepreneurs, mostly women ([Omran et al., 2025](#)). Furthermore, women's spatial awareness and mastery embedded in community structures demonstrate deeply rooted cultural norms that strengthen economic agency among women ([Butudoka et al., 2022](#)). These similarities underscore that socio-cultural support in the Indonesian context can serve as both a driver and a resource-rich foundation for women's entrepreneurial participation

#### **4.2.4 Digital knowledge and women's participation in entrepreneurship**

Digital Knowledge (DL) positively affects Women's Participation in Entrepreneurship (WP), with a relationship value between DL and WP of 0.307. It means that the higher the level of digital knowledge a woman has, the more likely she is to participate in entrepreneurial activities. Digital knowledge allows women to access technology-based entrepreneurial opportunities like e-commerce, online marketing, and freelance platforms. By understanding digital technology, women can utilise innovative tools to start, run, or grow their businesses. Digital knowledge helps women overcome geographical and cultural barriers by using digital platforms to expand market reach. Technology enables women to be more efficient in managing their businesses, such as using financial applications, inventory management systems, or marketing software. As shown in the regional spatial study by [Rahmoun & Zhao \(2024\)](#), local potential-based approaches and regional cluster network development have proven effective in promoting sustainable development in peripheral areas. **These findings align with the importance of creating** a digitally and socially connected women's MSME ecosystem in Indonesia to expand participatory impact and strengthen women's economic resilience.

#### **4.2.5 Access to information technology and women's participation in entrepreneurship**

Access to Technology (AIT) positively affects Women's Participation in Entrepreneurship (WP) with a Path coefficient of 0.274. The better women's access to technology, the more likely they are to participate in entrepreneurship. Access to technology allows women to connect with digital business platforms, expand market networks, and reach wider customers. Technology provides women with tools to manage their businesses more efficiently, such as using financial management applications or digital marketing. Technology helps women overcome geographical and social limitations by providing digital-based solutions to run a business. As demonstrated in a study of agro-industrial vitality in South Korea by [Gim et al. \(2023\)](#) business success is highly dependent on the synergy between internal firm characteristics and perceptions of external support, such as infrastructure and policies. This finding supports our research finding that

6 access to technology and social support play a crucial role in increasing women's participation in MSMEs.

#### 4.2.6 Social-cultural support and women's participation in entrepreneurship

37 The relationship value between Sc S and WP is 0.312, with a P value of 0.000 indicating a very significant relationship. Social support received by women will strengthen their possibility of participating in entrepreneurship. Social support includes emotional, informational, or material support provided by family, friends, community, or organisation. This support encourages women to start and manage their businesses, especially when facing social or economic barriers. A supportive social environment increases women's confidence in taking risks and making business decisions. Through social support, women can access the information, opportunities, and resources needed to start and grow a business. Socially supported women are more likely to contribute to the local economy by creating new employment opportunities.

#### 4.2.7 Financial Literacy as Intervening Variable

7 The relationship  $DK \rightarrow FL \rightarrow WP$  shows that FL is a significant mediator (Table 5). The same applies to  $AIT \rightarrow FL \rightarrow WP$  and  $Sc S \rightarrow FL \rightarrow WP$ , where FL mediates the influence of independent variables on WP. The Financial Literacy variable acts as an intervening variable (mediator) based on data processing results. Digital knowledge, access to technology, and social support influence financial literacy, increasing women's participation in entrepreneurship.

6 The intervening role of financial literacy in this study suggests that increased digital knowledge, access to technology, and socio-cultural support for women are more likely to contribute to increased participation in business activities when accompanied by a strong understanding of financial concepts and practices. Financial literacy can function through several mechanisms: first, facilitating access to and management of credit. Women with financial literacy can understand loan terms, interest rates, and repayment schedules, thereby mitigating the financial risks they face. Second, improving business planning and management skills. Women with good financial literacy are more skilled at developing business plans and allocating resources efficiently, which in turn improves business sustainability and viability. Third, strengthening risk-based decision-making. Financial literacy helps entrepreneurs assess potential risks and rewards, enabling them to make more informed decisions in a competitive market. These pathways align with previous research findings showing that financial knowledge empowers women to transform their resources and support into concrete entrepreneurial actions (Farrell et al., 2016).

Table 5. Indirect effects (Source: Author-Smart PLS4 output, 2025)

Indirect Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
AIT -> FL ->					
WP	0.060	0.061	0.017	3,455	0.001
DK -> FL -> WP	0.066	0.067	0.017	3,873	0,000

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Sc S -&gt; FL -&gt;

WP	0.065	0.064	0.013	4,923	0,000
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#### 4.2.8 Implications

4 The practical implications of this study are to provide insight into the fact that the government and related organisations need to provide technology-based training specifically designed for women so that they can optimise the use of technology in their daily lives. In addition to technology training, there needs to be a financial literacy program that utilises digital media to reach women, especially in remote areas. With increased digital knowledge and financial literacy, women can become more potent agents of economic change in families and society. In everyday life, it can be described that a woman who understands how an e-wallet application works will be better able to manage daily expenses, save, or even invest through the available features. Digital Literacy increases her financial literacy and provides opportunities to participate in more significant economic activities like entrepreneurship. With access to technology, women can learn about financial products such as savings, insurance, and investments, ultimately improving their financial literacy. Technology enables women to participate in digital financial services that may have previously been out of reach. Women who have better access to technology tend to be more confident in managing their finances, which can increase their economic independence. Access to IT also impacts improving the quality of life of families and women's contribution to the local economy. Governments and organisations must ensure equitable internet access, especially in rural areas. Training on using financial technology tools must be intensified to ensure women understand the benefits of developing digital financial platforms that are easy for women of all levels of education to use. With good social support, women can overcome structural or cultural barriers that often prevent them from improving financial literacy. Socio-cultural support contributes to women's economic independence, increases family financial stability, and expands women's economic participation.

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6 These results recommend encouraging the formation of women's communities to share financial information and experiences. Financial training helps families or social groups to create a supportive learning environment. Using a culturally based approach to encourage relevant social support for women in different regions. Women's participation in entrepreneurship supported by digital knowledge increases their income and creates employment opportunities for local communities. Digital knowledge strengthens women's financial independence and reduces economic dependency. Therefore, a unique technology training program for women is essential to help them understand and use digital tools in entrepreneurship. Developing user-friendly platforms that help women access entrepreneurship opportunities. Educating the community about the importance of digital knowledge in increasing women's participation in the digital-based economy. Access to technology also increases women's ability to take advantage of entrepreneurial opportunities based on innovation and creativity. With higher participation of women in entrepreneurship, there is potential for increased family income and women's empowerment in society. Women's participation in entrepreneurship also contributes to local economic growth, especially in the MSMEs sector. Governments and organisations must ensure equitable access to technology, including the Internet and digital devices, especially for women in rural areas. Just as disaster mitigation planning in rural areas

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requires a context-based and technology-based approach (Zhan et al., 2018). Empowering women in MSMEs also requires strategies that are appropriate to the uneven local social and infrastructure conditions. Educational programs to improve women's ability to use technology to support their businesses. Development of policies and infrastructure that support women entrepreneurs through digital platforms. Social support also helps build stronger networks of women entrepreneurs, which can expand market access and collaboration. Establishing community-based support groups to provide guidance, training, and motivation for women interested in entrepreneurship will increase women's roles in business. Encouraging cooperation among women entrepreneurs through forums or mentoring programs is essential. Governments and civil society organisations must support initiatives facilitating women's access to social support and entrepreneurial opportunities.

## 5. CONCLUSION

This study aims to analyse the influence of Digital Knowledge, Access to Information Technology, and Social Support on Women's Participation in Entrepreneurship and test Financial Literacy's role as an intervening variable. Based on data analysis using the Partial Least Squares (PLS) method, it can be concluded that Digital Knowledge, Access to Information Technology, and Social Support positively and significantly influence Financial Literacy and Women's Participation in Entrepreneurship. Financial literacy directly positively and substantially influences Women's Participation in Entrepreneurship. Good financial literacy helps women make wiser financial decisions, increasing entrepreneurship success. Financial literacy also acts as a mediating variable in the relationship between independent and dependent variables. This study enriches the literature on women's entrepreneurship by identifying the role of financial literacy as a significant mediator in the relationship between digital knowledge, technology access, social support, and women's participation in entrepreneurship. Special training is needed to improve women's financial literacy as a strategic step to encourage their involvement in entrepreneurship. Providing wider access to information technology and digital training can improve women's competence in managing their businesses. Promoting community support programs that involve families and communities can provide psychological support and necessary resources for women entrepreneurs. Integrating these research recommendations into development policies will expedite the achievement of Goals 5, 8, and 9 of the SDGs, thus contributing to sustainable and inclusive economic growth in Indonesia.

This study has several limitations. It focused only on certain variables and used a cross-sectional design (data collection at a single point in time), thus limiting the ability to draw causal conclusions regarding the relationship between digital knowledge, access to technology, socio-cultural support, financial literacy, and women's participation in MSMEs. The sampling approach used was non-probability sampling with a combination of quota and snowball sampling techniques, which may bias respondents with relatively better access to digital technology. As a result, the views of women with limited or no access to technology, particularly in rural or remote areas, may be underrepresented. Furthermore, this study's data is aggregated from various provinces without considering differences in cultural norms or infrastructure,

which may influence the relationships between variables. Therefore, the results of this study should be generalised with caution.

Further research is recommended to use stratified sampling to ensure a more balanced sample representation. Further research to obtain more specific results can be conducted with region-specific analyses that consider local cultural contexts and infrastructure. To strengthen conclusions and establish causality, a longitudinal or experimental design is recommended. Testing the role of financial literacy as a moderator variable can strengthen the understanding of how this variable influences the strength of the relationship between the main variables studied in this study.

## AUTHOR CONTRIBUTIONS

Conceptualization, D.S.C.; methodology, G.C.; data curation, R.S. and D.S.C.; writing original draft preparation, D.S.C. and G.C.; writing review and editing, R.S., S.D.A.T., and N.F.A.; supervision, D.S.C. All authors have read and agreed to the published version of the manuscript.

## ETHICS DECLARATION

The authors declare that they have no conflicts of interest regarding the publication of the paper.

## ACKNOWLEDGEMENT

We acknowledge the contribution of the Ministry of Education and Culture- Research and Technology, the Republic of Indonesia, for funding this study and providing the opportunity to conduct research. We want to thank the Indonesian Muslim Women Entrepreneurs Association (IPEMI) in Malang Regency.

## FUNDING

This research was funded by the Ministry of Education and Culture Research and Technology, Republic of Indonesia (No. 109/E5/PG.02.00.PL/2024).

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