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The Role of Digital and Financial Literacy in Driving Women Entrepreneurial Success: The Mediating Role of Digital Entrepreneurship

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Abstract

Purpose:Grounded in Resource-Based View theory and addressing Sustainable Development Goal 5 (gender equality and women's empowerment), this study has examined how digital literacy, financial literacy, and exploitation of entrepreneurial opportunities drive women's entrepreneurial success, with digital entrepreneurship as a mediating mechanism and legal and regulatory support as a moderating factor.

Methodology: With 688 women entrepreneurs working largely digital businesses (e-commerce, social media commerce, and online service platforms), A quantitative cross-sectional survey was conducted in main Pakistani urban centers like Islamabad, Rawalpindi, Lahore, and Karachi. Using a convenience sampling approach the Participants were engaged with the help of women entrepreneur associations, professional networks, and social media groups. By using the Partial Least Squares Structural Equation Modeling (PLS-SEM) in Smart PLS 4, data analysis was carried out. Given the appropriateness for prediction-focused research with non-normal data distributions, PLS-SEM was opted for.

Findings: Results validate that digital literacy ($\beta = 0.352$, $p < 0.001$), exploitation of entrepreneurial opportunities ($\beta = 0.409$, $p < 0.001$), and financial literacy ($\beta = 0.303$, $p < 0.001$) significantly predict entrepreneurial success. Digital entrepreneurship fully mediates all three relationships; the strongest indirect effect is observed for opportunity exploitation ($\beta = 0.589$, $p < 0.001$), followed by digital literacy ($\beta = 0.336$, $p < 0.001$) and financial literacy ($\beta = 0.100$, $p = 0.001$). Legal and regulatory support significantly moderates the digital entrepreneurship–success relationship ($\beta = 0.273$, $p = 0.014$), amplifying outcomes in more supportive institutional environments.

Theoretical and practical Contributions: The study advances Resource-Based View theory by demonstrating how intangible resources (digital and financial literacy) translate into competitive advantage through digital entrepreneurship. It also bridges gender, technology, and institutional perspectives, establishing digital entrepreneurship as a critical mediating pathway rather than just an outcome variable. The findings of the study can be leveraged by organizations to develop targeted training programs that combine digital and financial competencies with opportunity recognition skills, while ensuring alignment with institutional support systems to maximize entrepreneurial success outcomes.

Originality:This research has examined the understudied intersection of digital and financial literacies in women's entrepreneurship within South Asian contexts, establishing digital entrepreneurship as a novel mediating mechanism, and providing empirical evidence for the moderating role of institutional support in digital venture success.

Introduction

Entrepreneurship has been recognized as one of the driving forces for economic progress, social transformation, and innovation in the current global economy. The rapid pace of globalization and

digitalization has drastically transformed how new ventures are launched and expanded, particularly in developing nations where access to technology and education is expanding. Among emerging key challenges, Sustainable Development Goal 5 (SDG 5) – gender equality and the empowerment of women highlight the attention for inclusive engagement in economic growth (Arya et al., 2024). Entrepreneurship is widely regarded as a driver of innovation, job creation, and economic dynamism. The entrepreneurship literature has focused on identifying what promotes the establishment and success of new ventures (Shetty, Baliga & Gil, 2024). Arya et al (2024) and Gupta et al. (2024) conceptualize entrepreneurship as a process involving opportunity recognition, value creation, and resource allocation. Andriamahery and Qamruzzaman (2022) argue that entrepreneurship, in its broader form, is essential for economic and financial agility. While most of the literature has focused on structural and macroeconomic factors, recent research has highlighted the growing importance of personal competencies, such as digital literacy, financial knowledge, and innovation management, in shaping entrepreneurial outcomes (Nabi et al., 2021). Social and regulatory support structures also influence entrepreneurial journeys, making it clear that entrepreneurship cannot be studied in isolation from its surrounding environment (Klyver, Honig & Steffens, 2018).

While the increasing volume of entrepreneurship research, most of the literature is focused on Western or high-income economies, comparative studies that examine entrepreneurship in Asia, particularly from a gendered lens, are still scarce (Shepherd et al., 2019). In recent years, women-led online businesses in the South Asian context have gained importance, especially in urban centers of Pakistan, India, and Bangladesh (Amnache & Mekhzoumi, 2024). However, such ventures frequently operate under resource limitations and are shaped by sociocultural boundaries (Rizvi & Ahmed, 2024). To understand what enables or hinders the success of these women entrepreneurs, it is essential to assess their internal capabilities, such as digital and financial literacy, and how they exploit opportunities in a digital business environment. In the South Asian context, particularly in Pakistan, entrepreneurship remains predominantly male-driven (Aydin, Cavlan, Forson, & Ozbilgin, 2019). While recent years have seen a growing number of women stepping into the world of entrepreneurship, their ventures are often small-scale, home-based, and limited in growth potential (Anjum et al., 2012; Asif et al., 2017). This limited involvement originates from sociocultural barriers, lack of financial resources, and limited exposure to formal entrepreneurial education. Noor et al., 2021; Global Economy, 2017 highlights that although urban transformation has created a few opportunities but women in rural areas have been largely excluded from the entrepreneurial environment. COVID-19 highlighted the fragility of small, women-led ventures, emphasizing digital and financial literacy as key to resilience.

In connection with present studies, this study is built on the perspective of the **Resource-Based View (Barney, 1991),** which posits that the competitive advantage of an individual or an organization derives from the **valued, rare, inimitable, and non-interchangeable (VRIN) resources. This paper investigates how digital and financial literacies work as purposefully structured intangible assets generating balanced competitive advantage, covering this to the VRIO framework (Value, Rarity, Inimitability, Organization; Barney, 1991).** Intangible resources such as digital literacy, financial literacy, and the ability to exploit entrepreneurial opportunities bring competitive advantages and sustained growth in online

ventures. These resources are also recognized as internal assets that become critical for women entrepreneurs, who face external barriers such as gender norms, movement restrictions, and limited access to capital (Ahmed et al., 2025).

From the perspective of digital entrepreneurship, **digital and financial literacy** can be seen as strategic human capital resources. The ability to recognize and act upon these opportunities is a **core entrepreneurial skill** that directly influences success outcomes. Recently, Gupta et al. (2024) confirmed that the success of online ventures led by women entrepreneurs largely depends on their ability to use technological and financial tools for business visibility, customer engagement, and innovation. This makes the **Resource-Based View** a well-suited approach to explore the interaction between internal competencies and entrepreneurial outcomes in digitally driven environments characterized by gender diversity.

Moreover, it also includes legal and regulatory support as a moderating variable and **examines how digital and financial literacy, along with the exploitation of entrepreneurial opportunities, drive the success of women-led online businesses in the South Asian context.** Given the limited scope on women entrepreneurs in South Asia, this study offers important contributions to the field. First, it brings attention to entrepreneurial success as a distinct and under-explored outcome variable, shifting focus from generic business growth or profitability. Second, by applying the resource-based view in a developing-country context, the study provides theoretical insight into how intangible assets (e.g., knowledge and skills) drive success. Third, it bridges gender, technology, and institutional perspectives, offering a comprehensive view of what enables women entrepreneurs to thrive in digital environments. Finally, the study's findings can inform policymakers, development agencies, and training institutions about the types of support systems that are most effective for women-led ventures in emerging markets.

Literature Review and Hypotheses Development

Based on the review of the key concepts, key literature has been summarized in this section. In addition, the resource-based view has been integrated to illustrate key relationships. The theoretical framework is summarized in Figure 01.

Resource-based View

The theoretical underpinning of this study is grounded in the Resource-based View of the Firm, initially proposed by Wernerfelt (1984) and later expanded by Barney (1991). This perspective posits that a firm's competitive advantage and ultimate success are determined by its internal resources, specifically those that are valuable, rare, inimitable, and non-substitutable. This framework shifts the focus from external market conditions to the internal capabilities and resources that an entrepreneur or organization can transform into strengths to outperform competitors and achieve sustained success.

According to this study, women entrepreneurs' success in digital environments depends on using digital and financial literacy to develop opportunities, supporting effective customer reach, operations, and growth via e-commerce and digital tools. By executing the VRIN criteria of resource-based view, these skills exhibit restrained replicability and transferability (Teece, Pisano & Shuen, 1997). Likewise, financial literacy is considered a thought capability that develops tactical planning and operational control, equally correlated with higher chances of business existence and achievement (Lusardi & Mitchell, 2014). Furthermore, the addition of legal and regulatory support as a moderating variable shows how external institutions can boost or limit the efficiency of internal resources. In countries like Pakistan, evolving regulatory systems mean institutional support can either improve or confine the benefits of digital and financial literacy, specially where accessibility to justice, business registration, and intellectual property protection is frail. Further than RBV, this study illustrates the Attention-Based View (ABV) of the organization (Ocasio, 1997), arguing the entrepreneurial action is regulated by the entrepreneur's cognitive resource distribution. ABV complements RBV by elucidating the cognitive mechanisms enabling women entrepreneurs identify and prioritize prospects in digitally intricate environments: though RBV explains why digital and financial literacies discuss competitive advantage, ABV elucidates how these resources are stimulated by tactical consideration and opportunity identification, thus consolidating the theoretical foundation for digital entrepreneurship as a mediating way in the proposed model.

The Relationship between Digital Literacy and Entrepreneurial Success

Digital literacy broadly refers to the ability to access, evaluate, create, and communicate information using various digital tools and platforms (Eshet, 2002; Dutta & Mathur, 2014). Entrepreneurial success, on the other hand, shows conceptual diversity, as it is contextually influenced and often measured by a combination of financial and non-financial indicators. However, a widely accepted conceptualization comes from Gupta and York (2008), who define entrepreneurial success as "the accomplishment of entrepreneurial goals, which may include business survival, profitability, growth, and personal satisfaction."

In developing countries digital literacy and articulacy can work as empowering tools for women entrepreneurs by facilitating them to overcome conventional obstacles, outreach new customer bases, and improve the sustainability and success of their businesses (Gabrielsson et al. 2021). Demonstrating a significant and rare intangible resource that entrepreneurs can utilize for sustained competitive advantage; digital literacy associates with the Resource-Based View from a theoretical perspective. Aspects like age, educational background, cultural norms, and infrastructure access influence digital skills development (Hongthong & Temdee, 2018; Lynch, 2017; Reddy et al., 2017; Zhang & Zhu, 2016). As women in developing countries face compounded institutional barriers to accessing technology and training, digital presence in countryside and underserved areas requires modified policies. In South Asia the urban women entrepreneurs enjoy relatively improved access to smartphones, broadband, and digital

payment setups, while rural women struggle for substantial connectivity gaps which limit digital business adoption, making the rural-urban digital polarization severe (Vu, 2020; Noor et al., 2021). This polarization has significant consequences for resource access and entrepreneurial strategy, comparatively explaining why this research emphases on urban Pakistani entrepreneurs as a contextually limited sample; encompassing the analysis to rural and peri-urban surroundings remains a priority for forthcoming investigation. On this, the following hypothesis is derived:

H1

Digital literacy positively influences Entrepreneurial success.

The Relationship between Entrepreneurial Opportunities and Entrepreneurial Success

Exploitation of entrepreneurial opportunities refers to the strategic actions taken by individuals or firms to transform identified market gaps or innovations into sustainable ventures. Shane and Venkataraman (2000) define this as the process of “how, by whom, and with what consequences opportunities to produce future goods and services are discovered, evaluated, and exploited.” This process entails not just recognizing opportunities but also mobilizing resources, taking risks, and implementing innovative business ideas. Prior research emphasizes that while identifying opportunities is a vital stage of entrepreneurship, successful exploitation, through strategic action, innovation, and resource management, is what ultimately determines the business outcomes (Shane, 2003). However, empirical studies on how different forms of opportunity exploitation translate into entrepreneurial success, particularly in developing country contexts, remain underexplored (Stam et al., 2012). This leaves an important research gap in understanding the pathways through which opportunity-driven entrepreneurship leads to measurable success.

Entrepreneurial opportunity exploitation is influenced by various individual and institutional-level factors. According to Parker (2004), personal characteristics like demographics, personality traits, prior knowledge, and tolerance of risk shape whether individuals will pursue identified opportunities. However, entrepreneurial success isn't just about individual actions - it also depends on access to useful knowledge, technological infrastructure, and institutional support (Acs et al., 2005; Busenitz et al., 2014). Small firms and startups are particularly effective at turning knowledge into innovation, which boosts their success chances (Audretsch, 1995). Startups with solid foundations are better equipped to launch innovative products, adapt to market changes, and build competitive advantages - all contributing to long-term success.

Geographic location also matters. Firms in areas with high research and development activity have more opportunities to use external knowledge, increasing their likelihood of success. Successful entrepreneurs don't just identify and pursue opportunities - they also develop the organizational and intellectual strengths essential to utilize these opportunities for sustained advantage. Understanding the

relationship between exploiting entrepreneurial opportunities and achieving business success is crucial for stakeholders working to strengthen the business environment, especially in growing economies (Carree & Thurik 2010). Hence, the following hypothesis is proposed:

H2

Exploitation of entrepreneurial opportunities positively influences entrepreneurial success.

The Relationship between Financial Literacy and Entrepreneurial Success

Financial literacy is the ability to understand and use financial skills such as managing money, budgeting, and investing. For entrepreneurs, it is an essential skill that involves handling cash flows, reading financial statements, setting prices, and arranging financing while managing risks. Entrepreneurs with good financial literacy can make better decisions that keep their businesses profitable and successful over time (Wise, 2013).

Research shows that people with poor financial knowledge face more money problems, such as excessive borrowing (Lusardi & Tufano, 2009) and engaging in poor investment decisions (Alessie, Lusardi, & Van Rooij, 2007). They are also less prone to future planning (Lusardi & Mitchell, 2007a) and often avoid involvement in financial markets that offer them advantages (Remund 2010). These gaps can seriously hurt entrepreneurial success, which is typically measured by whether entrepreneurs achieve their business goals, like making profits, growing their companies, innovating, and building sustainable businesses (Fisher, Maritz, & Lobo, 2014).

For entrepreneurs, financial literacy acts as a mitigating factor against unexpected challenges, such as economic downturns or technological changes. Chiacchio, Petropoulos, and Pichler (2018) and Graetz and Michaels (2018) found that younger entrepreneurs, particularly those with limited financial knowledge, are more exposed to economic instability and technology disruptions. In contrast, entrepreneurs with solid financial understanding are more likely to develop strong survival strategies, keep enough cash on hand, and maintain their operations during tough times. Klapper, Lusardi, and Panos (2013) highlight that financial education enhances the ability to handle unexpected economic problems, facilitating business survival and progress despite uncertainty.

Insofar, financial literacy advances entrepreneurship, decreases inequalities, boosts social mobility, and forces inclusive economic growth (Atkinson & Messy, 2012). In developing countries where structural barriers constrain entrepreneurial growth, financial knowledge empowers entrepreneurs to secure funding, steer tax obligations, and guarantee regulatory compliance – critical factors for venture success. Furthermore, during the COVID-19 pandemic, empirical studies focused on the importance of financial literateness in crisis promptness and business steadiness. Financial literateness meets closely with digital financial inclusion significantly in developing economies like Pakistan. How women

entrepreneurs approach capital and manage payments has been transformed by the rise of mobile banking and fintech services (e.g., JazzCash, EasyPaisa); women with greater financial literacy are considerably better positioned to use these digital financial instruments for entrepreneurial growth (Mushtaq & Bruneau, 2019; Hossain, 2021). Consequently, we develop the following hypothesis:

H3

Financial Literacy positively influences entrepreneurial success.

The Mediating Role of Digital Entrepreneurship

According to Shane and Venkataraman (2000), a digital startup refers to "a firm, or an organization within an established firm," a definition that is particularly relevant for ventures in their early stages of development and growth (Klotz et al., 2013), where digital technologies are leveraged to enable critical components of the business model. The key elements of such models include the value proposition, value creation, value delivery, defined as the channels through which value is provided to customers, and the revenue model (Gabrielsson et al., 2016; Zaheer et al., 2019).

Digital entrepreneurship is also described as the development of business models that place digital technologies at the center as products, often complemented or enhanced by related digital services (Giones & Brem, 2017). In this way, digital technologies open new avenues for entrepreneurs by offering innovative tools and infrastructure that support the recognition and use of business opportunities (Gries & Naudé 2010). Given this potential, governments around the world are introducing policies to support small businesses and encourage the development of new ventures (Hilgert et al. 2003). This emphasis connects to a growing body of research examining how the regulatory framework influences entrepreneurial activity and, in turn, contributes to economic growth (Urbano et al., 2018). Hence, the following hypotheses have been proposed:

H4

Digital entrepreneurship mediates the relationship between digital literacy and entrepreneurial success.

H5

Digital entrepreneurship mediates the relationship between exploitation of entrepreneurial opportunities and entrepreneurial success.

H6

Digital entrepreneurship mediates the relationship between financial literacy and entrepreneurial success.

The Moderating Role of Legal and Regulatory Support

For new businesses to develop and grow, the presence of supportive entrepreneurial institutions is essential, as they provide laws and regulations that facilitate such growth. Support from the government is also necessary for success, especially in developing economies, since government policies can make it easier to access important information and increase the speed of processes that might otherwise be subject to regulatory delays. The government's support is particularly crucial for firms that have a customer-centric approach and hence must constantly strive to maintain their competitive advantage (Ambler & Styles 2000; Park & Luo, 2001). In some cases, the environment provided by certain institutions may favor or discourage entrepreneurship (Bruton et al., 2010; Kagan et al., 2011) for instance, some policies may increase the barriers for entrepreneurs (Bruton et al., 2010) and this can be true for any stage of the entrepreneurial process (Gnyawali & Fogel, 1994).

The extant literature suggests that the instability of governmental policies may lead to variance in entrepreneurial activities which in turn impact the development and growth of entrepreneurship (Hessels & Naudé 2019). For instance, according to Kagan et al., (2011), many business ventures had to be dissolved because of unstable policies due to changes in the rate of interest. Furthermore, as per Quartey (2001), unstable policies can negatively impact the rate of inflation such that there may be a variation in prices that may have an impact on the purchasing power of both entrepreneurs as well as consumers. In addition to that, there is a link between the instability of government policies and the price of imports or exports since unfavorable policies might devalue the local currency hence affecting the cost of importing or exporting goods (World Bank, 2005). Continuous innovation often demands a continuous supply of resources, which is why government policies relating to the financing or a reduction in taxes, may reduce the resource constraints for new ventures and their success (Gemser et al., 1996). In the case of certain markets, policies that facilitate securing capital may lower the barriers to entry for new ventures and facilitate innovation (Martin & Scott 2000). Furthermore, since the nature of innovations generally results in being both high cost as well as risky, government policies that reduce the impact of innovation failures may be essential for the growth of entrepreneurial ventures. Based on the above discussion, the following hypothesis has been suggested:

H7

Legal and regulatory support positively moderates the relationship between digital entrepreneurship and entrepreneurial success.

Methodology

Sample and Procedure

This study employed a quantitative approach using a cross-sectional survey design to examine the mediating role of digital entrepreneurship between digital literacy, financial literacy, exploitation of entrepreneurial opportunities, legal and regulatory support, and entrepreneurial success among women entrepreneurs in Pakistan. The target population comprised women entrepreneurs who operate their

businesses primarily through digital mediums such as social media platforms, e-commerce stores, and other online channels.

Data were accumulated from women entrepreneurs of major Pakistani urban clusters (Islamabad, Rawalpindi, Lahore, and Karachi) and choose secondary cities with prominent digital business activity (Faisalabad and Multan). Participants were obliged to self-identify as women, act as key founders or only decision-makers, operate primarily through digital networks (e.g., Facebook, Instagram, WhatsApp Business, or Daraz.pk), and keep at least six months of business. Businesses ranging from fashion, food and catering, handicrafts, educational services, and beauty and wellness sectors. The rural-urban digital access suggest significant disproportions in Pakistan; this geographic range is admitted as a generalizability constraint, discussed further in the limitations section.

A convenience sampling technique was adopted, consistent with prior behavioral and entrepreneurship research (Letchumanan & Tarmizi, 2011), due to the accessibility challenges in reaching women-owned digital businesses through random sampling methods. The questionnaire was distributed both physically and online via professional networks, women entrepreneur associations, and social media groups. Out of the distributed questionnaires, 412 responses were received. After removing incomplete responses and outliers, 376 valid responses were retained for the final analysis. The demographic details of respondents, including gender, age, education level, business sector, and years in operation, are presented in Table 1.

Measures

The questionnaire for this study included six variables: Digital Literacy, Financial Literacy, Exploitation of Entrepreneurial Opportunities, Legal and Regulatory Support, Digital Entrepreneurship, and Entrepreneurial Success. All items were measured using a 5-point Likert scale ranging from *1 = Strongly Disagree* to *5 = Strongly Agree*. Digital Literacy was measured using a 17-item scale adapted from Ng (2012). Financial Literacy was measured using a 37-item scale from Potrich et al. (2015). Exploitation of Entrepreneurial Opportunities was measured with a 4-item scale adapted from Kuckertz et al. (2017). Legal and Regulatory Support was measured using a 5-item scale developed based on prior entrepreneurship literature. Digital Entrepreneurship was measured using an 11-item scale adapted from Bollweg et al. (2020), Franco et al. (2016), and Hsieh & Wu (2019). Entrepreneurial Success was measured with a 12-item multi-dimensional scale adapted from Wach et al. (2016), covering financial performance, workplace relationships, personal fulfillment, community impact, and personal financial rewards.

The questionnaire underwent pre-testing with 15 women entrepreneurs to validate its clearness and contextual significance, after which small linguistic improvements were made to increase understanding. PLS-SEM was chosen over CB-SEM for three methodologically correct reasons: (1) the research is prediction-focused rather than only theory-assenting; (2) PLS-SEM is strong when distributional normality cannot be established; and (3) PLS-SEM is suggested for complex models

compounding reflective theories and moderated mediation paths (Hair et al., 2019; Ringle, Wende & Becker, 2015). For internal consistency, measurement model quality was assessed using Cronbach's alpha and composite reliability (CR > 0.7); Average Variance Extracted (AVE > 0.5) for convergent validity; and Heterotrait-Monotrait (HTMT) ratios (< 0.85) for discriminant validity. Structural model assessment comprised of path coefficients (β), bootstrapped t-statistics (5,000 subsamples), p-values, and effect sizes (f^2). Digital entrepreneurship as a mediator was operationalized as the strength of digital entrepreneurial activity, showing the extent to which entrepreneurs use digital technologies to produce, distribute, and capture value, measured across seven items covering digital platform usage, online customer engagement, and digital innovation (Bollweg et al., 2020; Franco et al., 2016; Hsieh & Wu, 2019).

Results

Table 1 reveals that the study sample consists entirely of female entrepreneurs (688 respondents, 100%), with the majority falling within the prime working age groups of 26–35 years (45.64%) and 36–45 years (33.43%). Results also show mostly well-educated participants, with nearly two-thirds holding graduate degrees (62.65%) and an additional third possessing master's qualifications (33.72%). Analysis indicates that the sample predominantly represents established but not mature businesses, with nearly half (46.8%) operating for 2–5 years and approximately one-third (30.52%) functioning for 6–10 years, suggesting the study captures entrepreneurs who have moved beyond the initial startup phase but yet not mature. The results of the demographic analysis reveal a demographic profile of educated, middle-aged female entrepreneurs operating moderately established businesses.

Table 1
Demographic characteristics of Respondents

Variable	Category	Frequency(n)	Percentage (%)
	Female	**688**	**100%**
Age	Below 25 years	78	11.34
	26–35 years	314	45.64
	36–45 years	230	33.43
	Above 45 Years	66	9.59
Qualification	Graduate	431	62.65
	Masters	232	33.72
	Above Masters	25	3.63
Age of business	Less than 1 year	89	12.94
	2–5 years	322	46.8
	6–10 years	210	30.52
	More than 10 years	67	9.74

Table 2 demonstrates all constructs exhibiting strong internal consistency with composite reliability values exceeding the threshold of 0.7, ranging from 0.873 for Digital Literacy to 0.938 for both Legal and Regulatory Support and Digital Entrepreneurship. Table 2 shows that Average Variance Extracted (AVE) values for all constructs surpass the minimum requirement of 0.5, with the highest AVE of 0.696 for Digital Literacy and the lowest of 0.611 for Digital Entrepreneurship. It also reveals that Digital Literacy items demonstrate factor loadings ranging from 0.673 to 0.863, with DL1 showing the highest loading. Table 2 indicates that Financial Literacy items exhibit loadings between 0.719 and 0.871, with FL1 demonstrating the strongest factor loading. Table 2 shows that the Exploitation of Entrepreneurship Opportunities items display consistent loadings from 0.813 to 0.853, with EO1 having the highest value.

Table 2
Factor loadings, mean and standard deviation

Construct	Item	Factor loadings	Composite Reliability (> 0.7)	AVE (> 0.5)
Digital Literacy	DL 1	0.863	0.873	0.696
	DL2	0.826		
	DL3	0.813		
	DL4	0.771		
	DL5	0.673		
	DL6	0.824		
	DL7	0.795		
	DL8	0.807		
	DL9	0.821		
Financial Literacy (FL)	FL 1	0.871	0.921	0.626
	FL2	0.719		
	FL2	0.810		
	FL3	0.867		
	FL4	0.772		
	FL5	0.777		
	FL6	0.721		
	FL7	0.811		
Exploitation of entrepreneurship Opportunities (EOE)	EO1	0.853	0.916	0.647
	EO2	0.841		
	EO3	0.813		
	EO4	0.832		
Legal and Regulatory Support (LRS)	LR1	0.746	0.938	0.685
	LR2	0.862		
	LR3	0.842		
	LR4	0.899		
	LR5	0.751		
Digital Entrepreneurship (DE)	DE	0.747	0.938	0.611

Construct	Item	Factor loadings	Composite Reliability (> 0.7)	AVE (> 0.5)
	DE2	0.863		
	DE3	0.842		
	DE4	0.871		
	DE5	0.719		
	DE6	0.810		
	DE7	0.867		
Entrepreneurial Success (ES)	ES1	0.772	0.899	0.691
	ES2	0.777		
	ES3	0.881		
	ES4	0.899		
	ES5	0.819		
	ES6	0.789		
	ES7	0.777		
	ES8	0.811		
	ES9	0.801		

Correlation analysis was performed next. Table 3 presents mean scores for all constructs ranging from 3.88 to 4.09, indicating generally positive responses across all measured variables. It shows Digital Literacy having highest mean score (4.09, SD = 0.75), followed closely by Financial Literacy (4.03, SD = 0.78). It also reveals that Digital Entrepreneurship exhibits the lowest mean score (3.88, SD = 0.82) among all constructs. Results show moderate to strong positive correlations between all constructs, with the strongest correlation observed between Legal and Regulatory Support and Digital Entrepreneurship (r = 0.79). Whereas, Financial Literacy has the strongest correlation with Exploitation of Entrepreneurship Opportunities (r = 0.76), while the weakest correlation exists between Digital Literacy and Digital Entrepreneurship (r = 0.46).

Table 3
Correlation Matrix and Internal consistency Reliability

Construct	Mean	S.D	DL	FL	EOE	LRS	DE	ES
Digital Literacy (DL)	4.09	0.75						
Financial Literacy (FL)	4.03	0.78	0.55	-				
Exploitation of entrepreneurship opportunities (EOE)	3.91	0.33	0.51	0.76				
Legal and regulatory support (LRS)	3.98	0.91	0.59	0.56	0.63			
Digital Entrepreneurship (DE)	3.88	0.82	0.46	0.56	0.54	0.79		
Entrepreneurial success (ES)	3.99	0.88	0.69	0.55	0.56	0.69	0.64	

Table 4 (HTMT analysis) confirms discriminant validity as all HTMT values fall below the conservative threshold of 0.85, with the highest value being 0.778 between Entrepreneurial Success and Legal and Regulatory Support. Results show that Digital Literacy demonstrates good discriminant validity with other constructs, with HTMT values ranging from 0.159 to 0.425.

Table 4
Discriminant Validity: HTMT

Digital Literacy (DL)	DL	FL	EOE	LRS	DE	ES
	-					
Financial Literacy (FL)	0.231	-				
Exploitation of entrepreneurship opportunities (EOE)	0.395	0.365	-			
Legal and regulatory support (LRS)	0.701	0.190	0.142	-		
Digital Entrepreneurship (DE)	0.432	0.425	0.611	0.175	-	
Entrepreneurial success (ES)	0.771	0.159	0.248	0.778	0.155	-

Analysis performed through structural equational modeling in Smart PLS 4 demonstrates all seven hypotheses are statistically significant, providing strong empirical support for the proposed research model. The results reveal Exploitation of Entrepreneurship Opportunities having strongest direct effect on Entrepreneurial Success ($\beta = 0.409$, $t = 6.950$, $p < 0.001$), followed by Digital Literacy ($\beta = 0.352$, $t = 2.101$, $p < 0.001$) and Financial Literacy ($\beta = 0.303$, $t = 2.590$, $p < 0.001$), indicating that opportunity recognition capabilities are the most crucial direct predictor of entrepreneurial outcomes. Mediation analysis the indirect effect of Exploitation of Entrepreneurship Opportunities on Entrepreneurial Success through Digital Entrepreneurship being the strongest pathway ($\beta = 0.589$, $t = 7.01$, $p < 0.001$), suggesting that opportunity exploitation significantly enhances entrepreneurial success when channeled through digital entrepreneurship activities. Similarly, Digital Literacy demonstrates a substantial indirect effect

through Digital Entrepreneurship (β = 0.336, t = 5.387, p < 0.001), while Financial Literacy shows a more modest but significant mediated relationship (β = 0.100, t = 5.15, p = 0.001). The moderation analysis confirms Legal and Regulatory Support significantly enhances the relationship between Digital Entrepreneurship and Entrepreneurial Success (β = 0.273, t = 2.839, p = 0.014), indicating supportive institutional environments amplifying the benefits of digital entrepreneurial activities for achieving business success.

Table 5
Structured Hypotheses Testing

Hypothesis	Path	Original Sample	Sample Mean	Standard Deviation	T statistics	P value
H1	Digital Literacy→ Entrepreneurial success	0.352	0.360	0.080	2.101	0.000
H2	Exploitation of entrepreneurship opportunities → Entrepreneurial success	0.409	0.412	0.077	6.950	0.000
H3	Financial Literacy → Entrepreneurial success	0.303	0.315	0.068	2.590	0.000
H4	Digital Literacy → Digital Entrepreneurship → Entrepreneurial success	0.336	0.331	0.062	5.387	0.000
H5	Exploitation of entrepreneurship opportunities → Digital Entrepreneurship → Entrepreneurial success	0.589	0.576	0.084	7.01	0.000
H6	Financial Literacy → Digital Entrepreneurship → Entrepreneurial success	0.100	0.089	0.089	5.15	0.001
H7	Digital Entrepreneurship * Legal and regulatory support → Entrepreneurial success	0.273	0.265	0.053	2.839	0.014

Discussion (Considering the Results obtained in Table 5)

This research studied the roles of digital literacy, entrepreneurial opportunity exploitation, and financial literacy in steering women's entrepreneurial success in Pakistan, with digital entrepreneurship as a mediator and legal-regulatory support as a moderator. The results are construed through the corresponding frameworks of the Resource-Based View (RBV; Barney, 1991) and Attention-Based View (ABV; Ocasio, 1997), highlighting how intangible resources are both held and cognitively organized

through digital entrepreneurial preparation to produce competitive advantage. The following paragraphs interpret each finding in relation to theory, prior empirical evidence, and policy context.

Digital skills, opportunity exploitation, and financial literacy arise as significant factors of entrepreneurial success, results consistent with resource-based theory and human capital theory. Digital literacy boosts entrepreneurs' absorptive capacity and facilitates the strategic use of technology for competitive advantage. The ability to grasp business opportunities supports the dynamic capabilities framework, emphasizing how opportunity recognition and exploitation under uncertainty provide sustained venture growth (Manzoor & Jalil 2014). Financial literacy further strengthens entrepreneurial performance by informing decision-making, risk assessment, and resource allocation.

Overall, findings show that entrepreneurial success depends not just on personal traits but also on the interaction between technological, cognitive, and financial skills. Future research could use a long-term approach to examine how these abilities evolve as ventures expand. Comparative studies might also reveal whether the effects vary between developing and advanced economies. Additionally, including psychological factors like resilience or a growth mindset could provide deeper insight into how digital and financial skills lead to opportunity exploitation.

The findings show digital entrepreneurship bridging digital skills, financial knowledge, the ability to seize opportunities, and overall entrepreneurial success. Put simply, having skills and knowledge is not enough alone; they need to be implemented through digital entrepreneurial practices for real impact. This highlights digital entrepreneurship as a central force turning individual abilities into successful outcomes, together with showing their effectiveness when supported by digital tools and practices fostering innovation and value creation.

Finally, the results supported the moderating role of legal and regulatory support in the relationship between digital entrepreneurship and entrepreneurial success. Implying the external frameworks and rules that shape organizational behaviors and outcomes, by providing evidence supporting legal structures which boosts the benefits of digital entrepreneurial activities. It further emphasizes that individual skills and digital capabilities lead to greater success when reinforced by facilitative institutional frameworks. Moreover, moderating role of regulatory support enriches the literature highlighting the effectiveness of digital entrepreneurship dependance on the strength of institutional environment. These findings enrich the research by emphasizing that entrepreneurial success is not entirely determined by individual skills or digital strategies, but also by the coordination of such strategies with institutional support structures. Future studies could examine how differences in institutional quality and regulatory frameworks across developed and emerging economies influence the strength of the digital entrepreneurship–success relationship.

Practical implications

The outcomes produce numerous exact, empirically correct practical propositions. Since digital literacy (β = 0.352, p < 0.001), opportunity exploitation (β = 0.409, p < 0.001), and financial literacy (β = 0.303, p < 0.001) highly foresee entrepreneurial success, targeted skill-building interventions are justified. Policymakers and growth institutions must: (1) Financial and digital literacy modules should be integrated within women's business development programs rather than delivered as separate trainings, thus binding their collaborative effects; (2) collaborations with community organizations and microcredit associations such as Akhuwat and NRSP can help context-sensitive delivery that relates opportunity recognition with practical digital tools; and (3) Pakistan's prevailing fintech structure, mainly JazzCash and EasyPaisa, should be used as practical platforms for financial literacy within entrepreneurial frameworks. Assumed digital entrepreneurship as mediator — reflected in the soundest indirect path (β = 0.589) for opportunity manipulation — investment in digital incubation programs and innovation hubs is critical, empowering women entrepreneurs to translate aptitudes into dynamic digital ventures through mechanisms including sponsored e-commerce platform access and social commerce trainings.

Second, given the central role of digital entrepreneurship in driving entrepreneurial success, there is a need to invest in internal training, digital platforms, and innovation-oriented cultures that enable entrepreneurial initiatives to flourish (Salamzadeh et al. 2025). Organizations should consider creating incubation or intrapreneurship programs that motivate employees to apply digital tools for opportunity exploitation, thereby enhancing competitiveness. Aligning workforce skills with digital entrepreneurial practices can help firms build a consistent flow of new ideas and long-term growth. Finally, the findings also highlight the vital role of legal and regulatory support in shaping entrepreneurial success.

The substantial moderating effect of legal and regulatory support (β = 0.273, p = 0.014) has obvious policy proposition. Experts should: (1) create "regulatory sandboxes" for women-led digital schemes to test business models with abridged compliance loads; (2) streamline registration processes that unduly delay resource-limited women organizers; and (3) accept gender-responsive policies tackling women's compounded hurdles to institutional support. At the firm level, engagement with entrepreneur organizations and advocacy platforms can mutually outline supporting directing environments, refining settings under which digital entrepreneurial capabilities transform into measurable success.

Declarations

Author Contribution

All the auhtors have contributed at each stage of research paper.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to restrictions related to participant

confidentiality, as the survey collected information from identifiable SME founders, owners, and managers under conditions of informed consent that did not include provisions for open data sharing.

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Figures

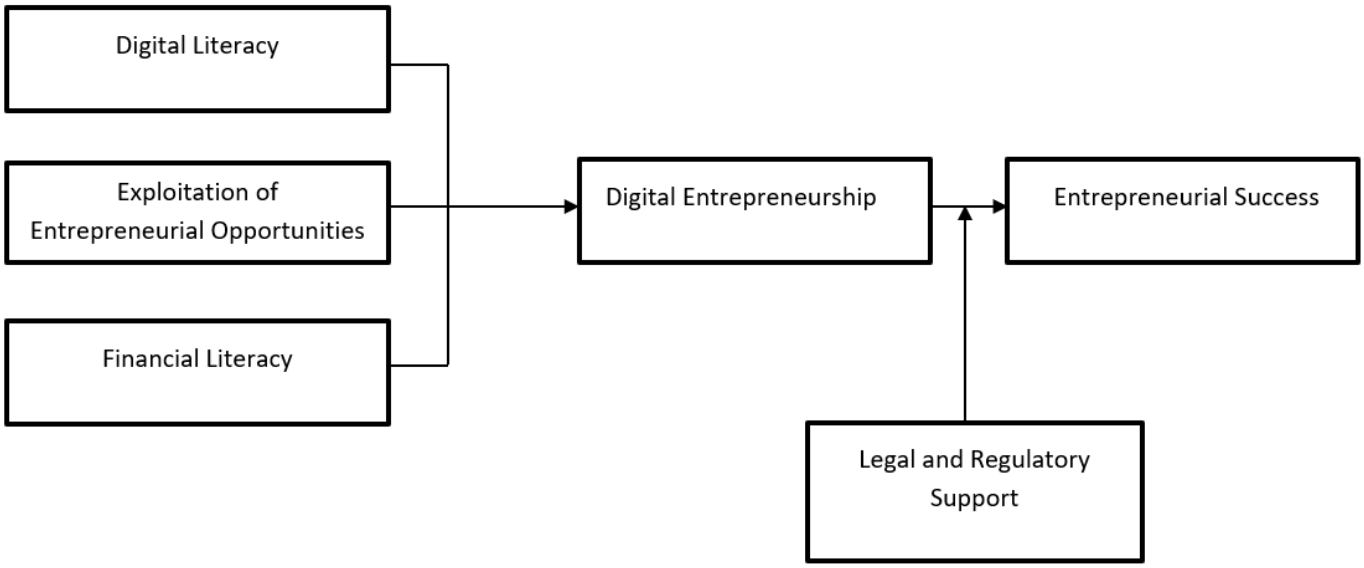


Figure 1

Research Framework