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Entrepreneurial resilience in the digital era: The role of entrepreneurial self-efficacy and passion

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ABSTRACT

Although digitalization has garnered a growing body of research, our understanding of when and how the adoption of digital technologies leads to more resilient entrepreneurial outcomes is limited. We draw on social cognitive theory to develop a moderated mediation model in which digital technologies indirectly promote entrepreneurial resilience through self-efficacy. We further propose that entrepreneurial passion serves as a key boundary condition that influences the strength of this indirect effect. Using data obtained from 300 SME owners/managers in the UK, the results suggest that entrepreneurial self-efficacy mediates the digitalization-resilience nexus, while entrepreneurial passion moderates this mediated relationship. We contribute to the entrepreneurship literature by highlighting that digitalization alone is insufficient to help entrepreneurs sustain their ventures in challenging conditions. Our results have significant implications for both practitioners and policymakers.

KEYWORDS

Digitalization; self-efficacy; entrepreneurial resilience; passion; social cognitive theory

Introduction

Entrepreneurial resilience is widely recognized in entrepreneurship research (Bullough et al., 2014; Santoro et al., 2021) due to its critical role in enabling individuals to adapt to disruptions and navigate uncertainties (Shepherd & Williams, 2023). Entrepreneurs face adversity and unpredictable events that threaten their businesses' survival, requiring resilience to develop and execute strategies to navigate these challenges (Hartmann et al., 2022; Santos et al., 2023). As a key strategic approach to building resilience, digitalization also offers opportunities for ventures to remain competitive in an evolving business landscape (Ardito et al., 2021; Khlystova & Kalyuzhnova, 2023). Through a strategic use of digital technologies, entrepreneurs can adapt to changes, and

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their businesses can persist amidst unpredictable market challenges (Khurana et al., 2022; Santos et al., 2023). The interplay between digitalization and entrepreneurial resilience has become a central topic in contemporary research, especially as technological advancements redefine entrepreneurial practices (Audretsch et al., 2024; Nambisan, 2017). Prior work notes that the positive impact of digitalization on resilience depends on other supporting capabilities such as innovation and learning, personal and organizational resources (Awad & Martín-Rojas, 2024; Fischer et al., 2023).

Although most recent research focuses on the COVID-19 crisis, showing that small and medium enterprises (SMEs) leveraged digitalization as a strategic response to develop entrepreneurial resilience in the face of sudden disruptions (Amankwah-Amoah et al., 2021; Audretsch et al., 2024; Modgil et al., 2022), there is a limited understanding of the underlying mechanisms through which this influence occurs, as well as the contextual factors that influence the link between digitalization and entrepreneurial resilience. Furthermore, little is known about entrepreneurs' psychological processes underlying the relationship between digitalization and entrepreneurial resilience (Hartmann et al., 2022), particularly among entrepreneurs in SMEs. In SMEs, the entrepreneur's psychological resilience is inseparable from the organizational resilience. Hence, examining how digitalization impacts entrepreneurial resilience is crucial to understanding how entrepreneurs navigate business health and success in a digitalized environment.

To address these gaps, we draw on social cognitive theory and argue that the sociotechnical process of applying digitizing techniques in business may not directly translate into entrepreneurial resilience if there is a lack of confidence in one's ability to manage the evolving business landscape. Prior research suggested that entrepreneurial self-efficacy (ESE) has been recognized as a driver of resilience (Bullough et al., 2014) and a critical factor in how entrepreneurs adopt digital technologies (Fisch & Block, 2021; Nambisan, 2017). Self-efficacy in the digitalized environment is generated through mastery experiences, vicarious learning, and social persuasion, shaping entrepreneurs' motivation and emotional engagement (Bachmann et al., 2024; Simba et al., 2025). SME owners become more confident in their decision-making when digital tools simplify tasks, facilitate resource access, and offer instant market feedback. However, the mechanism through which digitalization enhances ESE and fosters resilience remains unclear. Research also indicates that the relationship between digitalization and self-efficacy is influenced by various contextual factors (Malodia et al., 2023). We, therefore, contend that the presence of entrepreneurial passion would enhance entrepreneurs' confidence in leveraging digital technologies effectively (Holzmann & Gregori, 2023; Zaheer et al., 2022), as passion drives entrepreneurs' engagement with digital tools and strengthens their self-efficacy (Cardon & Kirk, 2015). Prior work also found that entrepreneurial passion heightened the impact of

cognitive belief on business opportunities identification and entrepreneurial intention (Costa et al., 2018; De Clercq et al., 2013). As such, we also argue that the presence of entrepreneurial passion enhances the effect of self-efficacy and entrepreneurial resilience, positioning it as a critical boundary condition in the relationship between digitalization and entrepreneurial resilience.

Following these arguments, this study examines: a) How does ESE mediate the relationship between digitalization and entrepreneurial resilience? and b) What is the moderating effect of entrepreneurial passion on both the digitalization–ESE and ESE–entrepreneurial resilience relationships? These questions are crucial to advance current understanding of entrepreneurial resilience amidst the ongoing adversity and business outlooks. The fast-paced development in the digitalized environment offers opportunities and threats to entrepreneurs (James et al., 2025). Hence, a clearer picture of the underlying psychological process that promotes entrepreneurial resilience would enhance business survivability and bring positive outcomes to the entrepreneurs and their businesses.

We collected data from 300 SME owners in the United Kingdom (UK) to answer these research questions. The UK has been at the forefront of integrating digital technologies into business operations, making it an ideal setting to examine the impact of digitalization on ESE and resilience (Gov.uk, 2025) and its ability to leverage digital transformation in overcoming economic and operational challenges. In addition, SMEs constitute a critical segment of the UK economy and play a pivotal role in driving economic growth and employment. Thus, understanding how digitalization enhances entrepreneurial resilience within SMEs offers valuable insights into how to strengthen SME sustainability in an increasingly digital environment (Renko et al., 2021).

This study contributes to entrepreneurship literature in various ways. First, this study extends the social cognitive theory by developing and testing a model highlighting the importance of integrating cognitive and motivational constructs into digital entrepreneurship research (Ng & Lucianetti, 2016; Gielnik et al., 2020). Research grounded in social cognitive theory suggests that self-efficacy operates through dynamic interactions between personal, behavioral, and environmental factors. By focusing on the digitalized environment, we illustrate social cognitive theory's relevance in digitally mediated environments. Furthermore, the study integrates cognitive (self-efficacy) and affective (passion) mechanisms to explain how digitalization translates into adaptive entrepreneurial behavior.

Second, this study contributes to the literature by theorizing and empirically showing how digitalization impacts entrepreneurial resilience via the mediating role of ESE. While previous studies have explored digitalization's external benefits and psychological factors independently, this research integrates these perspectives to illustrate a view of entrepreneurial resilience in the digital age (Coreynen et al., 2020; Fischer et al., 2023; Gerli et al., 2022). In addition, we

explore when this effect is most salient, particularly by considering the moderating role of entrepreneurial passion. We extend the literature by investigating the psychological mechanisms that influence the link between digitalization and entrepreneurial resilience, recognizing that SMEs often operate under resource constraints—making digitalization a strategic necessity rather than a luxury (Chaudhuri et al., 2022).

Second, this study provides important practical and policy implications for entrepreneurship in the UK by highlighting the need to develop deeper insights into how digital tools can be leveraged to strengthen entrepreneurial resilience through entrepreneurial self-efficacy and entrepreneurial passion, particularly in navigating unpredictable environments. For policymakers, the results highlight the value of refining existing policy frameworks to better support entrepreneurs in adopting digital innovations while sustaining the adaptability and motivational resources essential for resilience (George et al., 2021; Khan, 2023). Such policy reforms could enhance access to digital tools, offer low-cost technical solutions, and deliver targeted training initiatives aimed at bridging digital capability gaps.

Theoretical background and hypotheses development

Social cognitive theory (SCT)

Bandura (2001) developed social cognitive theory (SCT), focusing on the interplay of individual cognition, actions, and environmental factors in shaping human behavior. This framework, encapsulated in the triadic formulation of reciprocal causation, posits that human functioning is influenced by the dynamic interaction between behavioral, cognitive, and environmental realms (Wood & Bandura, 1989; Zhao & Zhou, 2021). At its core, SCT incorporates principal constructs such as self-regulation, self-efficacy, forethought, observational learning, and self-reflection. These constructs emphasize the capacity of individuals to influence their behavior, emotions, and environment proactively, fostering agency and adaptability (Schurz et al., 2021). The theory further argues that through modeling, self-regulation, and teamwork, individuals can develop the ability to act, believe, and adapt effectively to new conditions (Lim et al., 2020). As such, individuals set goals, monitor their progress, and adjust their actions to align with desired outcomes (Stajkovic & Luthans, 1998). SCT's relevance has since proliferated, particularly in entrepreneurship and small business management. Nevertheless, most of the research on SCT focuses on modeling and cognition, overlooking the emotional and motivational processes in entrepreneurship.

Digital technologies such as social media, mobile applications, and artificial intelligence (AI) provide new avenues for learning, self-regulation, and skill development (Lowry et al., 2017). For instance, platforms such as social media

and search engines enable entrepreneurs to access real-time information, seek peer modeling, and receive feedback, enhancing self-efficacy (Wei et al., 2011). Moreover, mobile technologies and AI can tailor interventions to match individual needs, helping entrepreneurs manage stress, improve resilience, and build competencies (Schade & Schuhmacher, 2022). These advancements align with the SCT premise that learning and behavior are shaped by the interplay between individual agency and environmental opportunities (Bandura, 2001). While SCT captures this short-term learning behavior, it has not offered much evidence on long-term behavioral changes like entrepreneurial resilience.

Defined as the capacity to persist and maintain a sense of purpose following hardship or adversity (Tedeschi & Calhoun, 2004), resilience is widely recognized in entrepreneurship research (Bullough et al., 2014; Santoro et al., 2021). It is associated with higher adaptability and persistence in volatile environments (Sun et al., 2020). The fast-paced, unpredictable environment, coupled with digitalization in business, raised the question of whether emphasizing personal ability alone could overcome the growing environmental constraints and produce long-term persistence.

Over the last decades, ESE, resilience, and passion have been extensively studied as critical entrepreneurial mindsets (Dheer & Castrogiovanni, 2023; Mueller et al., 2017). These constructs have been consistently associated with entrepreneurial intentions and behaviors, making them essential components of SCT in entrepreneurial research (Renko et al., 2021). Yet, limited work has examined the relationships of these constructs in digitalized settings. This article aligns with SCT by considering individuals to be active personal and professional development agents, capable of regulating their behaviors, thoughts, and emotions. As such, ESE plays a central role in this process by fostering the confidence needed in a digitalized environment, mitigating the impact of adverse environmental conditions (Wang et al., 2019). Passion, as a motivational construct, not only drives effort but also brings emotional engagement, reinforcing entrepreneurs' confidence in their ventures and resilience (Bullough et al., 2014; Newman et al., 2021). Examining the interplay of digitalization, ESE, resilience, and passion as key drivers of entrepreneurial competence enriches the value of SCT (Cardon & Kirk, 2015). The hypothesized relationships aim to advance understanding of how digitalization shapes entrepreneurial behavior (Dalborg & Wincent, 2015) and to offer valuable insights for fostering entrepreneurial success in the digital age (Bachmann et al., 2024).

Digitalization and entrepreneurial self-efficacy

Digitalization is described as "*the sociotechnical process of applying digitizing techniques to broader social and institutional contexts that render digital*

technologies infrastructure" (Tilson et al., 2010, p. 749). It is considered a crucial aspect of modern business operations, offering technological opportunities to remain competitive in the evolving business landscape (Khlystova & Kalyuzhnova, 2023). However, the external environment of digital technology may influence entrepreneurs' psychological needs. ESE is an essential component of the psychological drive for confidence in one's capabilities to perform the tasks successfully (Bandura, 1997; Newman et al., 2019). Scholars suggest that there are two opposing views on the relationship between digitalization and ESE. While the relationship is predominantly positive, with digital technologies as enablers of entrepreneurial confidence and capability (Fisch & Block, 2021), some scholars have raised concerns about the potential drawbacks of digitalization in the entrepreneurial context (Sahut et al., 2021). Overreliance on digital tools may lead to cognitive overload or decision paralysis due to the overwhelming volume of information available (Jammaers & Williams, 2023). Additionally, entrepreneurs with limited digital literacy may face challenges undermining their confidence, particularly in contexts where digital skills are prerequisites for success. These limitations, however, are typically outweighed by the overall benefits of digitalization in enhancing ESE (Fisch & Block, 2021; Nambisan, 2017).

The benefits of digitalization to ESE can be realized through various platforms and tools. For instance, platforms such as video tutorials, webinars, and entrepreneurial communities allow individuals to observe successful entrepreneurial behaviors and learn from the experiences of others (Meurer et al., 2022). This exposure builds confidence by demonstrating that entrepreneurial success is attainable, even in challenging contexts (Maran et al., 2022). Additionally, digital platforms enable immediate feedback mechanisms, allowing entrepreneurs to test and refine their ideas in real time, contributing to iterative learning and bolstering their belief in their abilities (Sahut et al., 2021). Social media platforms facilitate networking and provide access to diverse knowledge resources, reducing information asymmetry and enhancing entrepreneurs' confidence in decision-making (Jiang et al., 2024). Mobile applications and online learning platforms offer opportunities for skill development and task-specific mastery. Furthermore, big data and analytics tools provide entrepreneurs with actionable insights, enabling them to make informed decisions and reduce uncertainty in dynamic environments (Awan et al., 2021). These technologies foster a sense of control and capability, which are central to the development of ESE (Malodia et al., 2023; Stewart et al., 2023).

This study, therefore, argues that digitalization enables entrepreneurs to acquire skills, access information, and engage with diverse networks, supporting their sense of control and capability, which are key components of ESE. Digital tools' interactive and iterative nature complements entrepreneurship's dynamic nature, where this process builds confidence and further strengthens

ESE (Renko et al., 2021). Digitalization democratizes access to entrepreneurial resources, ensuring that individuals across diverse socioeconomic contexts can develop entrepreneurial skills and confidence (Martinez Dy et al., 2018). As such, we postulate a positive relationship between digitalization and ESE:

H1: *Digitalization positively impacts entrepreneurial self-efficacy.*

Entrepreneurial self-efficacy and entrepreneurial resilience

ESE, defined as "*beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments*" (Bandura, 1997, p. 3), enhances risk-taking and persistence, translating entrepreneurial capabilities into resilient behaviors (Gottschalck et al., 2024; Renko et al., 2021). We predict a positive relationship between ESE and entrepreneurial resilience. By believing in one's own abilities to leverage digital technologies, this psychological cognition promotes entrepreneurs' persistence and adaptability amidst challenges. While the relationship between ESE and entrepreneurial resilience has received attention in literature due to their foundational roles in shaping entrepreneurial behavior and success, limited work has examined their direct relationships. For instance, Renko et al. (2021) only found that both ESE and resilience parallelly affect entrepreneurial intentions. On the other hand, prior works evidenced that resilience is a critical enabler of ESE, where the strength and nature of this relationship may vary depending on individual characteristics and contextual conditions (Bullough et al., 2014; Santoro et al., 2020).

In this study, we contend that ESE promotes greater cognitive reappraisal abilities, allowing entrepreneurs to interpret failures as learning opportunities rather than terminal setbacks (Chen et al., 1998). This mindset fosters adaptive responses and diminishes the psychological burden of failure, contributing to enhanced resilience. Moreover, ESE is associated with improved emotional regulation, which helps entrepreneurs manage stress and maintain emotional stability during crises. This regulatory capability is critical in environments where sustained stress can undermine resilience (Lafuente et al., 2019). Furthermore, ESE helps entrepreneurs to adopt proactive problem-solving approaches, characterized by innovative thinking and persistence in addressing challenges (Santoro et al., 2020). Such behavioral traits reinforce their ability to adapt and thrive under adverse conditions.

In the digitalized environment, we posit that ESE consistently emerges as a critical enabler of entrepreneurs' capacity to adapt and persist in adversity. This alignment suggests that ESE is not only a predictor of resilience but also serves as its psychological foundation for entrepreneurs to persist in adversity,

sustain motivation, and actively seek innovative solutions to overcome challenges. Thus, we hypothesize:

H2: *Entrepreneurial self-efficacy positively impacts entrepreneurial resilience.*

Mediating role of entrepreneurial self-efficacy

Integrating the earlier arguments and hypotheses, we suggest a crucial mediating role of ESE with the possibility of amplifying the effect of digitalization on entrepreneurial resilience. Digitalization introduces uncertainty and constant change, critical stressors in the entrepreneurial environment (Awan et al., 2021). Sinha et al. (2024) proved that digitalization brings opportunities and challenges. Still, its positive impact on resilience is contingent upon the entrepreneur's confidence, perceptions, and response to the challenges and opportunities presented by digital tools (Bullough et al., 2014). For example, digital tools, such as big data analytics and mobile applications, provide entrepreneurs with valuable insights and resources (Awan et al., 2021). However, without the self-belief that they can interpret and apply these insights effectively, the entrepreneur may fail to adapt to changes in the business environment or persevere in the face of challenges (Nambisan, 2017).

Digitalization alone may not enhance resilience unless the individual believes in their ability to navigate digital platforms and extract value from them successfully. Entrepreneurs may perceive unpredictable changes in the digitalized environment as threats, leading to stress and limiting the development of entrepreneurial resilience (Symon & Whiting, 2019). Conversely, the presence of ESE encourages entrepreneurs to see these challenges as opportunities for growth by reframing challenges, identifying solutions, and remaining adaptable (Malodia et al., 2023). This ability to adapt can promote resilience, particularly in environments characterized by rapid technological advancement. As the psychological process of how digitalization brings resilience has not been fully examined, we argue that ESE is a critical mechanism through which digitalization can enhance resilience with entrepreneurs' confidence in using these digital resources productively (Khurana et al., 2022; Renko et al., 2021). By fostering the belief that challenges can be managed, ESE enhances entrepreneurs' likelihood of adopting adaptive strategies, thereby improving resilience (Santos et al., 2023). This mediating role of ESE highlights the importance of confidence and adaptability in translating the opportunities presented by digitalization into meaningful entrepreneurial outcomes. Thus, based on these insights, we hypothesize that:

H3: *Entrepreneurial self-efficacy positively mediates the relationship between digitalization and entrepreneurial resilience.*

Moderating role of entrepreneurial passion

In extending the application of SCT, we propose the moderating role of entrepreneurial passion, a powerful motivational force that shapes how individuals navigate challenges and opportunities in the entrepreneurial process (Newman et al., 2021; Schwarte et al., 2023), on the mediated relationship. Cardon et al. (2009, p. 517) defined entrepreneurial passion as "*consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur*." Newman et al.'s (2021) review of entrepreneurial passion highlighted a lack of studies in considering its moderator roles in entrepreneurial behavior and outcomes. In the handful of studies that examined entrepreneurial passion's moderator role, only Costa et al. (2018) drew on SCT with an experimental approach. Hence, we propose that entrepreneurial passion moderates the relationship between digitalization and ESE (Hypothesis 1) and between ESE and entrepreneurial resilience (Hypothesis 2). With SCT emphasizing the cognitive domain, the consideration of this affective aspect is vital to explain the psychological process in the digitalization-resilience link.

In a digitalized environment, this intrinsic motivational passion is crucial in determining how effectively entrepreneurs leverage digital tools to strengthen self-efficacy (Cardon & Kirk, 2015). Passionate entrepreneurs are more likely to boost ESE to embrace digital technologies enthusiastically, persist through technological complexities, and utilize digital resources to strengthen their competencies (Bouhalleb & Haddoud, 2024; Davis et al., 2017). Entrepreneurial passion amplifies the positive impact of digitalization on self-efficacy by fostering a proactive learning orientation in the face of digital transformation (Cardon & Kirk, 2015). Therefore, it is suggested that highly passionate entrepreneurs perceive digitalization as an enabler rather than a disruptive force (Zaheer et al., 2022), reinforcing their confidence in effectively harnessing digital advancements (Holzmann & Gregori, 2023). In contrast, entrepreneurs with low passion may struggle to capitalize on digitalization due to a lack of motivation to explore, experiment, and adapt (Bachmann et al., 2024). Digital tools may seem complex or overwhelming if the entrepreneur has a low level of passion, leading to lower engagement and limited self-efficacy gains (Dalborg & Wincent, 2015). Aligned with motivation theory, which suggests that passion sustains effort in skill development and adaptation, particularly in dynamic environments, the impact of digitalization on self-efficacy is expected to be significantly stronger among entrepreneurs with high passion compared to those with low passion (Cardon & Kirk, 2015). We predict:

***H4a**: Entrepreneurial passion moderates the relationship between digitalization and self-efficacy, such that this relationship is stronger when entrepreneurial passion is high.*

Entrepreneurial passion is also expected to strengthen the positive relationship between self-efficacy and entrepreneurial resilience. Passion fosters perseverance, creativity, and adaptability in uncertain environments (Cardon et al., 2013). Entrepreneurs with high levels of passion actively seek mastery experiences, reinforcing their confidence and belief in their ability to succeed (Abubakre et al., 2022). Several studies confirmed a positive relationship between entrepreneurial passion and ESE in different contexts (Dalborg & Wincent, 2015; Huyghe et al., 2016). Cardon and Kirk (2015) also noted that passion helps entrepreneurs rebound from failure because it strengthens entrepreneurial persistence. However, there are limited studies on the interaction between ESE and entrepreneurial passion that could possibly affect the magnitude of resilience.

In this study, we argue that entrepreneurial passion enhances self-efficacy and positive outcome expectations, which promote resilient coping behaviors. Confident entrepreneurs are more likely to be reinforced by their passion for managing entrepreneurial challenges. In the presence of ESE, where entrepreneurs are confident of their abilities to organize and execute business actions, a high level of entrepreneurial passion fuels motivation, optimism, and perseverance, which are critical to entrepreneurial resilience (Cardon & Kirk, 2015). On the contrary, when entrepreneurial passion is low, entrepreneurs lack the personal motivation to overcome challenges and adversity in business. The deficiency in motivation impacts the influence of ESE on resilience. Hence, a high level of this intrinsic motivation aggravates the relationship between entrepreneurs' beliefs about their own capabilities and their aim to sustain and regain business purpose in the face of adversity, uncertainty, or failure (Ayala & Manzano, 2014). Thus, the following hypothesis is proposed:

***H4b**: Entrepreneurial passion moderates the relationship between self-efficacy and entrepreneurial resilience, such that this relationship is stronger when entrepreneurial passion is high.*

Conceptual model

Figure 1 illustrates the connections between the main variables in our study, building on the reasoning presented in our hypotheses. The model illustrates that digitalization and ESE of SME owners promote entrepreneurial resilience. It is expected that adding entrepreneurial passion as a moderating variable will strengthen the positive correlation between

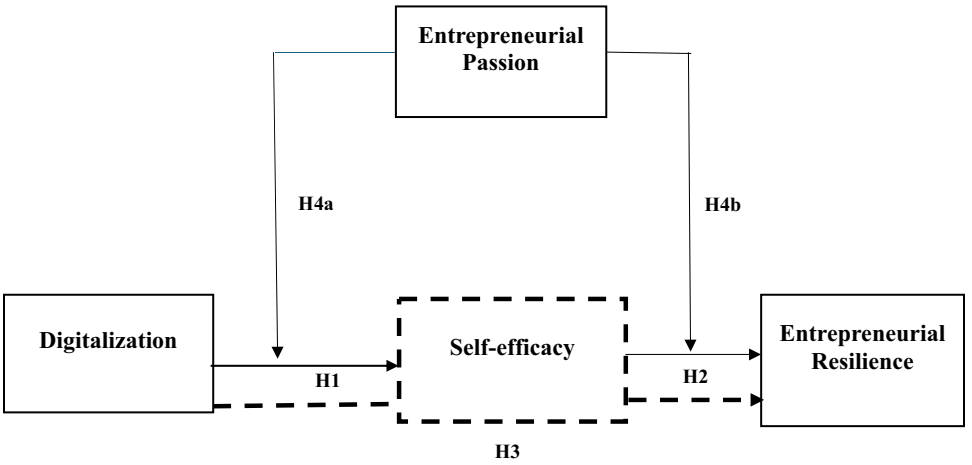

Figure 1. Conceptual model.

digitalization and ESE. Furthermore, the relationship between ESE and entrepreneurial resilience is anticipated to be strengthened by entrepreneurial passion.

Method

Data and sample

A sample of UK-based SMEs was used to test our hypotheses due to the country's proactive adoption of digital transformation and technological advancements (Gyamerah et al., 2025). The UK has been at the forefront of integrating digital technologies into business operations, making it an ideal setting to examine the impact of digitalization on ESE and resilience (Gov.uk, 2025). One key reason for selecting the UK is its ability to leverage digital transformation to overcome economic and operational challenges. For instance, during the COVID-19 crisis, businesses in the UK demonstrated significant resilience by rapidly adopting digital tools to maintain operations, transition to remote work, and continue serving customers (Fletcher & Griffiths, 2020). This adaptability has set a precedent for small businesses, encouraging them to embrace digitalization to achieve the resilience that larger firms have attained through technological integration (Sinha et al., 2024). Focusing on small businesses in the UK, our study captures a critical segment of the economy that plays a pivotal role in economic growth and employment. SMEs often face resource constraints, making digitalization a strategic necessity rather than a luxury (Chaudhuri et al., 2022). Understanding how digital tools enhance ESE and resilience within this context provides valuable insights for policymakers, business owners, and support

institutions aiming to strengthen SME sustainability in an increasingly digital world (Renko et al., 2021).

Data collection was carried out over four months, from July to October 2024, via an online survey distributed to SME founders through Prolific. This online research platform enables researchers to collect data from a diverse pool of respondents. The survey's cover page detailed its purpose and included measurement items for the study variables. Following previous studies (Antcliff et al., 2021; Korosteleva et al., 2024), SMEs were defined in line with the UK Longitudinal Small Business Survey as firms with fewer than 250 employees (Department for Business & Trade, 2024). Thus, respondents from Prolific were selected based on the following criteria: respondents were first asked whether they personally owned or co-owned the business or acted as its managing director; only positive responses proceeded. Next, data were gathered on full-time equivalent employees and turnover. Based on the typical UK SME survey protocols (Longitudinal Small Business Survey), entries that exceeded the SME size band or displayed unrealistic combinations of size and industry were eliminated during data cleaning. This step ensured verification of both firm size and respondent role. Prior research suggests that globally active firms are more likely to use digital tools for global client engagement (Lee et al., 2012), so respondents were also asked about their involvement in international business operations, such as entering foreign markets or expanding through international subsidiaries.

Based on the criteria outlined above, a non-probability sampling approach was employed. Specifically, convenience sampling was used, as only participants meeting the study's eligibility criteria were included. This method is also appropriate because it enables a rapid and cost-effective way of recruiting respondents (Onofrei et al., 2022). This approach initially generated approximately 780 potential participants, whose profiles were screened to make sure that they were SMEs and met the study's criteria, which included using digital technologies as their main means of communication. The final cleaned sample included only respondents who met all eligibility and verification requirements. Of the initial recruits, 335 responses were received (42.94 percent response rate). After reviewing the questionnaires, 35 incomplete responses were excluded, resulting in a final sample of 300 complete responses (38.46 percent adjusted response rate).

Sample characteristics

Table 1 summarizes the demographic profile of the survey participants. The sample comprised a majority of male respondents (57 percent) aged 25 and under to over 56, thus capturing a broad spectrum of age groups. Regarding the participating SMEs, 57 percent had been in operation for seven to eight years on average, and 24 percent employed between 11 and 30 individuals. The

Table 1. Sample characteristics.

Variables	Category	Frequency	Percentage
Gender	Male	170	57%
	Female	130	43%
Age	25 or younger	19	6%
	26–35	59	20%
	36–45	101	34%
	46–55	94	31%
	Over 56	27	9%
Education	High School	45	15%
	HND	31	10%
	Bachelors	135	45%
	Post	80	27%
	Others	9	3%
Marital status	Married	175	58%
	Unmarried	111	37%
	Others	14	5%
Company size	10 or below	62	21%
	11–30	72	24%
	31–50	49	16%
	51 or above	117	39%
Company age	2 years	20	6%
	3–4 years	47	16%
	5–6 years	62	21%
	7–8 years	171	57%
Industry type	Industrial	61	21%
	Commercial	148	49%
	services	84	28%
	agricultural	7	2%

Notes: $N = 300$.

most prevalent business sectors were commercial (49 percent) and industrial (21 percent), representing 70 percent of the sample industries.

Measures

The scales were used in their original formats. All the items in a preliminary online pilot test with nine business owners were found to be culturally and linguistically appropriate for a UK setting. As a result, no modifications were needed, and the results confirm the measures' face validity and clarity in the context of UK business.

Dependent variable

We measured our dependent variable, entrepreneurial resilience, using four items from Sinclair and Wallston (2004). The items were measured on a 7-point scale, ranging from *does not describe me at all* to *describes me very well*. Sample items include "I actively look for ways to replace the losses I encounter in life" and "I believe that I can grow positively by dealing with difficult situations." The resilience scale is reliable (Nunnally, 1978) and has been used by previous entrepreneurship studies (Bullough et al., 2014; Santoro et al., 2021).

Independent variable

We evaluated digitalization using five items by El Baz and Ruel (2024). Such digitalization was measured on a 7-point scale with 1 for *strongly disagree* and 7 for *strongly agree*. Sample items include "Our organization is capable of acquiring important digital technologies" and "Our organization is capable of designing an adequate response to digital transformation."

Mediating variable

We measured entrepreneurial self-efficacy using six items developed by Shahab et al. (2019) using a 7-point scale with 1 for *strongly disagree* and 7 for *strongly agree*. Sample items include "I can work productively under continuous stress, pressure, and conflict" and "I can develop and maintain favorable relationships with potential investors."

Moderating variable

Following previous studies (Adomako et al., 2023; Zhu et al., 2024), we measured entrepreneurial passion using the items developed by Cardon et al. (2013). A 7-point scale was used, with 1 for *strongly disagree* and 7 for *strongly agree*. Sample items include "Owning my own company energizes me," "I like finding the right people to market my product/service to" and "Assembling the right people to work for my business is exciting."

Control variables

We incorporated several control variables in our analysis that affect entrepreneurial resilience at the owner and SME levels. At the owner level, we controlled the owners' gender, age, and education. Gender was coded as 1 = *male* and 0 = *female*. Research suggests that women entrepreneurs frequently use relationship resources to build resilience and sustain business operations (Fairlie & Robb, 2009). In addition, women-owned firms commonly exhibit survival-related resilience that exceeds that of male-owned businesses (Kalnins & Williams, 2014). Owners' age was controlled because the CEO's age could reflect their confidence level in decision-making. Age was measured as a categorical variable (1 = 25 or younger; 2 = 26–25; 3 = 36–45; 4 = 46–55; and 5 = over 56). We also checked for the owner's education as a categorical variable: 1 = *high school* to 5 = *other qualifications*. Literature suggests that higher levels of entrepreneurial resilience are consistently associated with entrepreneurship education (González-López et al., 2019). At the firm level, we

controlled the firm's size, age, and industry. Firm age was assessed based on the years since its establishment, while the total number of employees measured firm size. We controlled industry types using a categorical variable: 1 = *industrial*, 2 = *commercial*, 3 = *services*, 4 = *agricultural*. Tanveer et al. (2024) found that resilience practices are influenced by sectors and differ between industries. Because of their adaptability, creativity, and capacity to take advantage of the digital revolution, knowledge-intensive and creative industries typically show greater resilience. In addition, Duan et al. (2022) suggested that the structure of an industry can enhance or impede resilience. Finally, we controlled the entrepreneurial experience by asking the participants about the number of businesses/ventures they had founded before the current business. Entrepreneurs with prior business failures become more resilient than individuals without such experience (Espinoza-Benavides & Guerrero, 2025).

Data analysis

Reliability and validity assessment

Confirmatory factor analysis (CFA) was conducted using AMOS 28 with maximum likelihood (ML) estimation to assess the validity and reliability of the primary constructs. The model demonstrated acceptable fit to the data (χ^2/df = 636.333/224; CFI = 0.91; SRMR = 0.06; RMSEA = 0.07; TLI = 0.88). Standardized estimates for the CFA constructs are presented in Table 2, where all item factor loadings exceeded 0.5. Convergent validity was established through significant factor loadings ($p < .01$), as recommended by Bagozzi and Yi (1988), and average variance extracted (AVE) values exceeding 0.50 (Fornell & Larcker, 1981). Reliability was assessed using Cronbach's alpha and composite reliability (CR). Both measures surpassed the 0.70 threshold (Cronbach's alpha and CR), indicating satisfactory reliability and robustness of the constructs, respectively (Netemeyer et al., 2003).

Non-response bias

We assessed the potential for non-response bias using two established methods. First, following Wagner and Kemmerling (2010), we compared responses from complete and incomplete surveys using independent samples *t*-tests. No statistically significant differences were found between these groups, suggesting minimal impact from non-response. Second, we employed the approach described by Armstrong and Overton (1977), comparing early and late respondents and using independent samples *t*-tests. Additionally, no

Table 2. Construct validity and reliability.

Items	Factor loading	AVE	CR	Cronbach's alpha
Digitalization		0.87	0.97	0.92
D1: Our organization is capable of acquiring important digital technologies.	0.89			
D2: Our organization can identify new digital opportunities.	0.96			
D3: Our organization is capable of designing adequate response to digital transformation.	0.97			
D4: Our organization is up to date with the state of the art of digital technologies.	0.94			
D5: Our organization can develop innovative products/services/innovations using digital technologies.	0.91			
Entrepreneurial Self-efficacy		0.80	0.96	0.86
SE1. I can work productively under continuous stress, pressure, and conflict.	0.76			
SE2. I can originate new ideas and products.	0.97			
SE3. I can develop and maintain favorable relationships with potential investors.	0.94			
SE4. I can see new market opportunities for new products and services.	0.91			
SE5. I can recruit and train key employees.	0.88			
SE6. I can develop a working environment that encourages people to try out something new.	0.90			
Entrepreneurial Passion		0.76	0.96	0.91
EP1. Establishing a new company excites me.	0.98			
EP2. Owning my own company energizes me.	0.91			
EP3. Nurturing a new business through its emerging success is enjoyable.	0.88			
EP4. Being the founder of a business is an important part of who I am.	0.86			
EP5. I really like finding the right people to market my product/service to.	0.85			
EP6. Assembling the right people to work for my business is exciting.	0.90			
EP7. Pushing my employees and myself to make our company better motivates me.	0.80			
EP8. Nurturing and growing companies is an important part of who I am.	0.78			
Entrepreneurial resilience		0.79	0.94	0.82
ER1. I actively look for ways to replace the losses I encounter in life.	0.91			
ER2. I believe that I can grow in positive ways by dealing with difficult situations.	0.92			
ER3. I look for creative ways to alter difficult situations.	0.88			
ER4. Regardless of what happens to me, I believe I can control my reaction to it	0.86			

Notes: AVE = average variance extracted; CR = composite reliability.

significant differences emerged, supporting the conclusion that non-response bias did not appreciably influence our results.

Common method bias

Several procedural and statistical steps were taken to mitigate potential common method bias. First, given the study's focus on indirect effects, common method bias was considered less of a concern (Siemsen et al., 2010). Second, survey items were carefully developed. The language was refined in consultation with industry practitioners for clarity and relevance (MacKenzie & Podsakoff, 2012). Furthermore, items were strategically distributed throughout the survey to minimize respondents' ability to discern relationships between variables (Nagy et al., 2024). To further mitigate potential bias, several steps were taken. Firstly, the respondents were highly educated and experienced, which can reduce response bias. Secondly, they

were assured of anonymity and confidentiality, which can reduce social desirability bias and other response biases (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003). Finally, Harman's single-factor test was conducted to assess the presence of common method bias statistically. Principal component analysis (PCA) without rotation was applied to the study variables. The analysis revealed five factors with eigenvalues greater than 1.0, collectively explaining 37.45 percent of the total variance. However, the first factor accounted for only 8.33 percent of the variance, and no single factor was dominant. This result indicates that common method bias did not significantly affect the study's results.

Econometric model

The study hypotheses were examined using stepwise hierarchical regression analysis outlined by Aiken and West (1991). This method is well-suited for contextual and configurational analytical models (Cohen et al., 2003) and is an efficient estimator commonly employed in entrepreneurship research (Rauch et al., 2009). In conducting this analysis, Step 1 incorporated control and dependent variables. In Step 2, digitalization was introduced, and in Step 3, the interaction effects were included. The interaction terms were generated by mean-centering both the independent and moderator variables to enhance the interpretability of the results (Dawson, 2014). To evaluate the moderated mediation model, we utilized PROCESS, a tool developed by Preacher et al. (2007). This approach was chosen over structural equation modeling (SEM) due to its ability to handle mediation and moderation models effectively. Additionally, PROCESS provides quick statistical outputs, whereas SEM requires specialized programming skills (Lythreatis et al., 2021) and is less suitable for complex moderated mediation analyses (Hayes et al., 2017).

To address the issue of endogeneity, we applied the Hausman test, following White et al. (2022). The results indicate that simultaneity bias is not present among our key variables. In addition, we draw on prior studies (Luo & Bu, 2018; Tantawy et al., 2025; White et al., 2022) to examine additional sources of endogeneity issues, including reverse causality, measurement error, and omitted variable bias (Wooldridge, 2002). Although our study uses cross-sectional data, reverse causality is not expected to be a problem because the independent variable—digitalization—cannot plausibly be influenced or determined by entrepreneurial resilience (see robustness tests for more details). Additionally, we based the measurement items on established empirical studies, as shown in the measurement section. The results show strong construct validity, and reliability results suggest that measurement error is not a major concern. Finally, to reduce the risk of omitted variable bias arising from unobserved confounders that could simultaneously affect both independent and dependent variables, we included controls for industry-specific

factors that might shape SME behavior. Importantly, after using these controls, the main and moderating effects remain significant.

Results

Descriptive statistics

Table 3 presents the descriptive statistics, including the primary study variables' mean, standard deviation, and correlation matrix, analyzed using STATA 18.0. To better explain the results, we defined the interaction terms by mean-centering both the independent and moderator variables (Aiken & West, 1991). The table reveals that digitalization, self-efficacy, entrepreneurial passion, and entrepreneurial resilience exhibit positive correlations with one another. Following a regression analysis, multicollinearity was assessed using the variance inflation factor (VIF). The results showed an average VIF of 1.41, with all factors remaining below the threshold of 10. This suggests that multicollinearity was not a concern in this study, and there were no significant correlations among the independent variables (Hair et al., 2010).

Main results

Table 4 shows the findings of the hierarchical regression analysis used in testing the main hypotheses. H1 proposed that digitalization would be positively related to ESE. The results of Model 2 show that digitalization was positively associated with ESE ($\beta = 0.25$, SE = 0.04, $p < .01$). It was observed that R^2 had changed significantly ($\Delta R^2 = 0.42$). Therefore, Hypothesis 1 was supported. H2 proposed that ESE would be positively associated with entrepreneurial resilience. The results of Model 5 show that there was a positive and significant relationship between ESE and entrepreneurial resilience ($\beta = 0.48$, SE = 0.05, $p < .01$). In addition, R^2 had also changed significantly ($\Delta R^2 = 0.40$). Consequently, Hypothesis 2 was supported.

Hypothesis 3 proposed that ESE mediates the relationship between digitalization and entrepreneurial resilience. To assess this mediation effect, we employed the SPSS macro-PROCESS developed by Hayes (2013) to analyze the indirect influence of digitalization on entrepreneurial resilience via ESE. Additionally, we utilized the bootstrapping approach recommended by Preacher et al. (2007) to test the significance of the indirect effects. Mediation is supported if the 95 percent confidence interval (CI) for the indirect effect does not include zero. As shown in Table 5, the results indicate a significant and positive indirect effect ($\beta = 0.47$, SE = 0.05, CI = [0.37, 0.57]), confirming Hypothesis 3 and suggesting a partial mediation effect of ESE in the relationship between digitalization and entrepreneurial resilience.

Table 3. Descriptive statistics and correlation matrix.

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. Gender	.565	.497	1.00										
2. Age	2.83	1.048	0.010	1.00									
3. Education	2.923	1.043	−0.041	−0.050	1.00								
4. Firm Age	3.95	1.381	0.028	0.253	−0.089	1.00							
5. Firm Size	2.737	1.18	−0.041	0.011	0.042	0.339	1.00						
6. Industry	2.66	1.523	−0.032	0.024	0.203	0.036	−0.009	1.00					
7. Experience	3.37	1.299	−0.025	0.141	0.184	−0.088	0.012	0.039	1.00				
8. Digitalization	5.029	1.261	0.099	0.022	0.007	−0.066	−0.046	−0.099	0.184	1.00			
9. Self-efficacy	5.446	.943	−0.042	0.047	0.082	0.035	0.037	0.010	0.075	0.497	1.00		
10. Passion	5.328	1.356	0.072	0.060	0.003	−0.123	−0.076	−0.041	0.166	0.444	0.565	1.00	
11. Resilience	5.451	.959	0.045	0.006	0.054	−0.066	−0.043	−0.020	0.122	0.504	0.615	0.570	1.00

Notes: $N = 300$; *** $p < .001$, ** $p < .01$, * $p < .05$.

Table 4. Regression results.

	DV = Self-efficacy						DV = Entrepreneurial Resilience							
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Variable	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*	Coeff.	*SE*
Gender	−0.064	0.111	−0.145*	0.085	−0.157*	0.083	0.121	0.112	0.144*	0.086	0.126	0.085	0.075	0.083
Founder age	0.030	0.055	0.024	0.042	0.036	0.041	0.000	0.056	−0.016	0.043	−0.007	0.042	−0.007	0.041
9+Founder education	0.065	0.055	0.068	0.042	0.061	0.041	0.022	0.056	−0.010	0.043	−0.010	0.042	0.000	0.041
Firm age	0.021	0.045	0.062*	0.034	0.067**	0.033	−0.034	0.045	−0.027	0.035	−0.017	0.034	−0.011	0.034
Firm size	0.014	0.050	0.026	0.038	0.045	0.038	−0.033	0.051	−0.039	0.039	−0.021	0.039	−0.014	0.038
Industry	0.011	0.011	0.033	0.008	0.031	0.028	0.022	0.011	−0.015	0.029	−0.013	0.028	0.001	0.028
Experience	−0.010	0.037	−0.011	0.028	−0.013	0.008	−0.03**	0.037	0.011	0.008	0.009	0.008	0.003	0.008
Independent variable														
Digitalization			0.248***	0.038	0.145**	0.049							0.206*	0.092
Moderator														
Entrepreneurial Passion			0.315***	0.034	0.259***	0.038			0.173***	0.039	0.122**	0.042	0.094*	0.042
Interaction effect														
Digitalization X passion					0.021***	0.006							0.017***	0.006
Self-Efficacy X passion											0.019***	0.006	0.025***	0.019
Mediator														
Self-Efficacy									0.476***	0.056	0.358**	0.068	0.247*	0.101
Model Fit Statistics														
F-value	0.623		24.833		24.213		1.209		24.459		23.557		22.445	
R2	0.02		0.436		0.457		0.028		0.432		0.450		0.485	
ΔR2			0.421		0.021				0.404		0.018		0.035	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Table 5. Bootstrapping results of digitalization on entrepreneurial resilience through self-efficacy.

Variable	Effect	*SE*	CI
Total effect	0.67	0.04	[0.15, 0.30]
Direct effect	0.20	0.04	[0.13, 0.27]
Indirect effect	0.47	0.05	[0.37, 0.57]

Notes: CI = confidence interval.

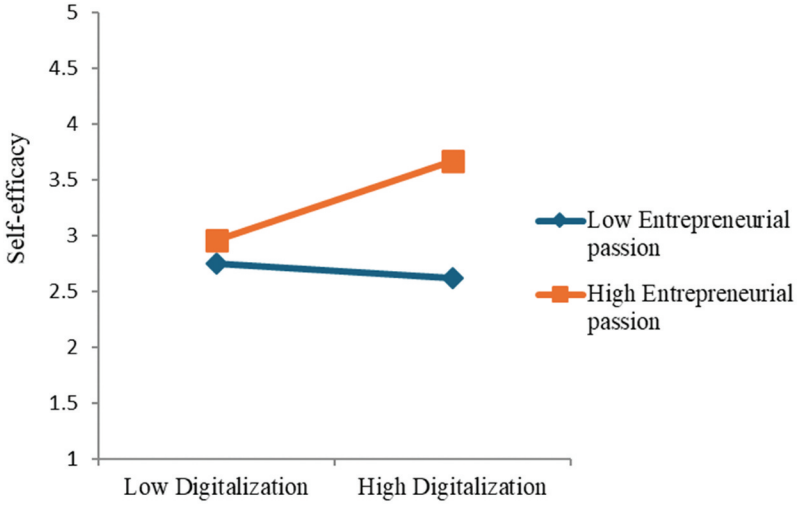

Figure 2. Interaction of digitalization and entrepreneurial passion on entrepreneurial self-efficacy.

Hypothesis 4a proposed that entrepreneurial passion moderates the relationship between digitalization and ESE. The findings from Model 3, shown in Table 4, indicate that the interaction effect was positive and significant ($\beta = 0.21$, SE = 0.006, $p < .01$); therefore, Hypothesis 4a was supported. To illustrate the moderating effect, the interaction impacts were presented in Figure 2. Slope tests indicate that digitalization had a positive influence on ESE when passion was high (one standard deviation above the mean). In contrast, when passion was low (one standard deviation below the mean), the effect was negative and statistically insignificant. These findings confirm the moderating role of passion in the relationship between digitalization and ESE.

Hypothesis 4b proposed that entrepreneurial passion moderates the relationship between ESE and entrepreneurial resilience. Results from Model 6 in Table 4 show that the interaction term was positive and statistically significant ($\beta = 0.02$, SE = 0.01, $p < .01$); therefore, Hypothesis 4b was supported. To demonstrate the moderating effect, the interaction impacts were generated, as shown in Figure 3. The results indicate that the relationship between ESE

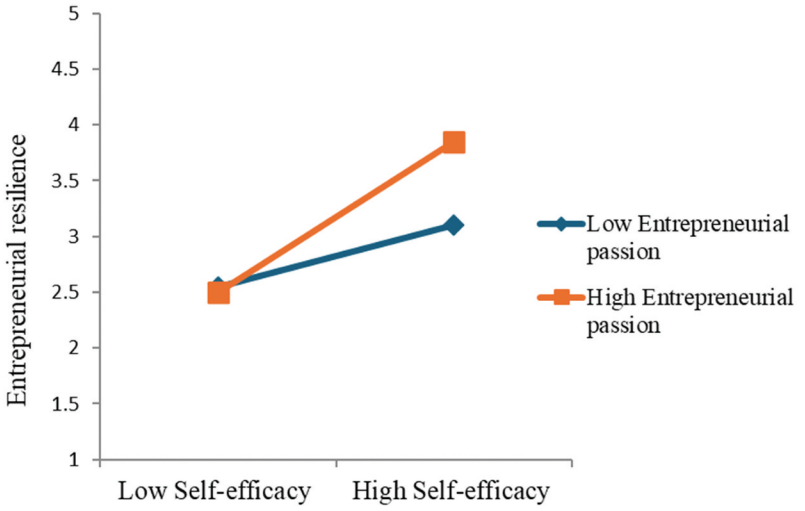

Figure 3. Interaction of self-efficacy and entrepreneurial passion on entrepreneurial resilience.

Table 6. Bootstrapping results of digitalization on entrepreneurial resilience through self-efficacy at different levels of entrepreneurial passion.

Conditional Indirect Effect	Effect	*SE*	CI
Passion: The mean minus one *SD*	0.31	0.05	[−0.22, 0.40]
Passion: The mean	0.23	0.04	[0.15, 0.30]
Passion: The mean plus one *SD*	0.14	0.05	[0.05, 0.24]

Notes: SD = standard deviation; CI = confidence interval.

and entrepreneurial resilience is stronger when entrepreneurial passion is high versus low.

To test the moderated mediation model, we employed Preacher et al.'s (2007) approach, which involved a bootstrapping test to assess the significance of indirect effects without assuming normality assumptions. We also utilized the SPSS macro-PROCESS developed by Hayes (2013) to examine the indirect effects of digitalization on entrepreneurial resilience through ESE at different levels of entrepreneurial passion. The results presented in Table 6 indicate that the conditional indirect effect at high levels of entrepreneurial passion (one standard deviation above the mean) was significant ($\beta = 0.14$, SE = 0.05, CI = [0.05, 0.24]).

Robustness tests

To ensure the robustness of the results, we conducted additional analyses. First, we performed the main analysis without including any control variables. This approach allowed us to assess the impact of contextual variables while minimizing the risk of overfitting, thereby providing a clearer understanding

Table 7. Sobel test.

Indirect effect	A	B	SEA	SEB	Z-value	*p*-value
Self-Efficacy	0.252	0.358	0.038	0.055	4.645	.000

Notes: A = raw (unstandardized) regression coefficient for the association between independent and mediator variables; B = raw coefficient for the association between the mediator and the dependent variables (when the IV is also a predictor of the DV); SEA = standard error of A; SEB = standard error of B; Z-value = Sobel Test; *p*-value = probability (** ≤ .05).

of the role control variables play in shaping the relationship between the independent and dependent variables (Becker et al., 2016; Fieberg et al., 2021). The findings remained consistent, confirming the stability of the results. Second, we employed the Sobel test to assess whether a mediator meaningfully explains the relationship between X and Y (Sobel, 1987). Specifically, we conducted a Sobel test to determine whether the indirect effect of digitalization on entrepreneurial resilience through ESE was statistically significant. A mediation hypothesis is supported if the Sobel test produces a Z-value ≥1.98 at a significance level of ≤0.05. As shown in Table 7, the test yielded a Z-value of 4.645 with a significance level of ≤0.05, confirming that ESE significantly mediates this relationship, which is consistent with our main findings. Finally, to assess the possibility of reverse causality, we re-estimated the models using a hierarchical analysis, treating digitalization as the dependent variable and entrepreneurial resilience as the independent variable, along with the control variables included in the study. The results revealed no significant relationship between entrepreneurial resilience and digitalization ($\beta = 0.01$, $SE = 0.06$, $p = .91$). Therefore, these findings align with the main study results, reinforcing the robustness of our conclusions.

Discussion

This study sought to examine the psychological process underpinning the relationship between digitalization and entrepreneurial resilience by hypothesizing ESE as the mediator and entrepreneurial passion as the moderator in this baseline relationship. Drawing on data collected from 300 manager-owners of SMEs in the UK, our findings provided empirical support for the hypotheses. The results show that there is a positive relationship between digitalization and ESE, illustrating how digital tools and platforms help entrepreneurs foster self-confidence. In other words, digitalization enhances resilience not directly but through entrepreneurs' confidence in their ability to navigate and apply digital tools effectively. Then, our results also support the positive relationship between ESE and entrepreneurial resilience, confirming that self-efficacy fosters perseverance and adaptive coping strategies (Bullough et al., 2014). Hence, our study provides novel insights into the mediating role of ESE in the digitalization–resilience relationship. The empirical results

explain the psychological dimension in the digitalization–resilience link, where we found ESE acts as a cognitive bridge, translating digital resources into adaptive capacities. This finding shows that merely adopting digital tools is insufficient; entrepreneurs must internalize and develop confidence in leveraging these tools to enhance their resilience. The results are particularly relevant for SMEs, which may lack larger firms' institutional buffers and rely more on individual psychological capacities to withstand uncertainties. As a boundary condition, our results also confirm the moderating role of entrepreneurial passion in strengthening the digitalization–ESE relationship.

Prior research has highlighted passion as a critical driver of entrepreneurial persistence (Cardon & Kirk, 2015), yet its interaction with self-efficacy in fostering resilience has been underexplored. Our study expands this discussion by demonstrating that entrepreneurs with high passion amplified the benefits of ESE from their digitalization efforts. Thus, entrepreneurial passion strengthens this process by amplifying the positive effect of digitalization on self-efficacy and, in turn, on resilience. In addition, entrepreneurial passion strengthens the positive relationship between self-efficacy and resilience. For SMEs, where personal motivation often directly influences business survival, these findings suggest that fostering passion through intrinsic motivation, networking with like-minded entrepreneurs, and engagement in purposeful ventures can catalyze digitalization to elevate entrepreneurs' self-efficacy and promote resilient coping behaviors.

Theoretical contributions

Our research makes significant contributions to entrepreneurship literature. First, prior studies have predominantly examined digitalization in terms of operational efficiency and market expansion (Berman et al., 2024; Nambisan, 2017); our study provides novel insights into its psychological impact. Our study contributes by demonstrating how digitalization enhances ESE via facilitating cognitive (learning and skill acquisition) and supporting entrepreneurs' self-belief in overcoming adversity and developing entrepreneurial resilience. While previous studies have emphasized the role of self-efficacy in entrepreneurial decision-making, our study spotlights its role in the digitalization-resilience link in the SME context (Bandura, 2001; Zhao & Zhou, 2021). By elucidating these mechanisms, we bridge the gap between digitalization and individual-level entrepreneurial competencies, offering a more holistic understanding of how digital tools shape entrepreneurial agency and decision-making. This nuanced perspective on SCT highlights how emotional engagement enhances resilience-building mechanisms (Cardon et al., 2009).

Furthermore, previous work has established that entrepreneurial passion acts as a psychological buffer, enhancing entrepreneurs' self-confidence, adaptability, and perseverance in volatile environments (Sinha et al., 2024).

Our study extends entrepreneurial resilience literature by integrating SCT with entrepreneurial passion. Besides showing that digitalization serves as a critical enabler of resilience by incorporating the crucial role of ESE, our study reveals the emotional role of entrepreneurial passion in strengthening the digitalization-resilience link. Building on this, our study advances resilience research by explaining the psychological and emotional mechanisms that help entrepreneurs navigate uncertainty in a digitalized environment (Bullough et al., 2014; Shepherd & Williams, 2023). This insight underscores the interplay between cognition, emotion, and digitalization, offering a multidimensional view of entrepreneurial adaptation and persistence in the digital era.

Additionally, we contribute to SCT by extending its application to digital entrepreneurship within the SME context. SCT has traditionally been explored in offline entrepreneurial settings (Bandura, 2001), but our findings disclose its growing relevance in digitally mediated environments. While existing literature has largely examined digitalization's direct effects on firm performance and innovation (Santoro et al., 2020), we reveal a crucial psychological mechanism through which digitalization fosters resilience. Thus, the study extends social cognitive theory into the digital entrepreneurship domain by integrating cognitive (self-efficacy) and affective (passion) mechanisms that explain how digitalization translates into adaptive entrepreneurial behavior.

Practical implications

This study offers several actionable insights for SME owner-managers navigating unpredictable environments. The findings underscore the importance of adopting digitalization as a strategic capability, rather than a temporary reaction to environmental uncertainty. SME owners should prioritize the integration of digital tools that enhance operational efficiency, streamline communication with customers, and provide flexible modes of service delivery. The results indicate that entrepreneurial self-efficacy plays a mediating role in the relationship between digitalization and entrepreneurial resilience; therefore, SME owners should invest in developing their digital confidence and competence. This can be achieved through structured learning, hands-on experimentation, and participation in entrepreneurial networks. Engaging in peer communities, online training programs, and industry-focused digital workshops can enhance perceived mastery, reduce technology-related anxiety, and support more effective decision-making.

Furthermore, the moderating influence of entrepreneurial passion demonstrates that emotional engagement with venture amplifies the benefits of both digitalization and self-efficacy. SME owners could therefore consciously engage in passion-sustaining practices, such as setting personally meaningful goals, aligning business activities with intrinsic motivations, and investing

time in creative or customer-centered aspects of the venture. The findings also suggest that psychological resources and digital capabilities should be developed simultaneously. Support organizations, such as business incubators, SME associations, and entrepreneurship centers, can use these insights to design hybrid programs that combine digital training, resilience-building, and psychological skill development.

By demonstrating how digitalization fosters mastery experiences, vicarious learning, and social persuasion, we offer a contemporary adaptation of SCT that aligns with the realities of digital entrepreneurship. This contribution is particularly valuable for understanding how SME entrepreneurs, who often operate in resource-scarce contexts, leverage digital technologies to build resilience and sustain their ventures in turbulent environments.

Policy implications

The study also offers valuable implications for policymakers seeking to strengthen the resilience and competitiveness of SMEs. First, the findings highlight the need for national digitalization strategies that prioritize SME capacity-building, particularly in sectors most affected by environmental turbulence. The evidence indicates the need for governments to develop targeted programs that subsidize access to digital tools, provide low-cost technological solutions, and deliver tailored training to bridge digital capability gaps. In addition, governments could also promote ecosystem-based support models by establishing regional digital innovation hubs, SME technical advisory centers, and public–private partnerships that provide comprehensive digital, financial, and emotional support. These ecosystems enable SMEs to access not only technology but also mentorship, peer networks, and strategic guidance. Empirical evidence shows that state-supported digital adoption reduces vulnerability and boosts SME recovery following crises (Ahamed et al., 2025; Audretsch et al., 2024).

As our insights suggest that entrepreneurial self-efficacy significantly influences resilience, policymakers could incorporate psychological capability-building into entrepreneurship development programs. These findings provide guidance and insights that national agencies can use to design interventions focusing on confidence-building, mastery learning, peer modeling, and guided experimentation as part of digital upskilling initiatives. Recent studies emphasize that psychological resources are equally as important as financial and technological inputs in enabling SMEs to cope with shocks (Hartmann et al., 2022; Shepherd & Williams, 2023). Moreover, given that entrepreneurial passion enhances the effectiveness of digitalization and resilience, policymakers could encourage entrepreneurial motivation and identity-building programs, such as purpose-driven entrepreneurship training, national

entrepreneurial competitions, and mentorship networks that reinforce long-term engagement.

Limitations and future research

Some limitations in this study must be noted in interpreting the results. First, the cross-sectional research design provides a snapshot of the psychological process underpinning the digitalization–resilience relationship at a specific point in time. They may not accurately reflect changes in the digital realms and environmental conditions of entrepreneurs over time. Hence, we suggest that future research should conduct longitudinal studies to track changes over time, particularly the emotional dimension of passion, which may wane due to personal interests and motivations. Second, we collected our data using Prolific, an online platform that provided effective sampling and quick access to a wide range of participants. However, the sample is non-probability convenience sampling rather than being a completely random selection of the target population. The sample frame is restricted to registered Prolific participants rather than the entire population of SME owners, which restricts generalizability and does not guarantee complete external representativeness. We therefore recommend that future research replicate the study using different sampling frames, such as national SME databases or industry registries, to enhance external validity. Third, the present study collected data from SMEs operating in the UK. To investigate potential causal effects in various contexts, future research would benefit from examining these relationships in other developed and developing economies. Prior research suggests that SMEs operate in a variety of regulatory, economic, and cultural contexts (Child et al., 2022), which can add significant variation and increase the validity of results. Future research could improve external validity by determining whether the UK patterns are context-specific or more broadly applicable. Analyzing the impact of digital adoption on entrepreneurial outcomes in various institutional contexts, for instance, may highlight significant contextual variations. Comparative research would produce richer insights and help address the limitations of single-country studies, considering differences in educational systems, cognitive abilities, and levels of digitalization across countries. Lastly, the present study gathered responses from SMEs operating in the UK. Hence, these findings may not directly apply to business owners running larger firms due to variations in resources and business practices.

Conclusion

This study examined how digitalization influences entrepreneurial resilience among SME owner-managers, emphasizing the mediating role of ESE and the moderating role of entrepreneurial passion. The findings suggest that digital transformation in SMEs should not be viewed merely as a technological endeavor but as a process of capability and confidence building. Entrepreneurs can enhance resilience by adopting accessible, resource-efficient digital tools and by cultivating passion and self-belief in leveraging these technologies. This research underscores that in the digital era, entrepreneurial resilience emerges not solely from external technologies but also from the interplay between digital adoption, self-efficacy, and passion.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

Data will be available on request.

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